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by J. Ralston Skinner

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GREAT PYRAMID OF JEEZEH IN EGYPT

JULY, 1884.

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THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 64 EUCLID AVENUE

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WILLIAM OSBURN,

Author of the "Monumental History of Egypt," "Israel in Egypt," etc.

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THE INTERNATIONAL STANDARD.

JULY, 1884.

THE HISTORY OF THE GREAT PYRAMID.

III.

In 842 A. D. Al Mamoun died at Bagdad, and for many years the Great Pyramid stood under the cloudless sky, and amid the desert sands of Egypt, just as it had stood for so many ages before, undisturbed by the hand of man—its white slopes, in all the beauty of perfect geometric form, gleaming daily in the noontide sun. The wild, barbarous peoples which writhed or rotted in the valley of the Nile hard by knew and could know nothing concerning it. And could they, or those as regardless of it as they, have ruled in that land till now, well would it have been for the pyramids, and for whatever of message they bore to the generations of men which were to come after. But the deluge period came at length to this mightiest work of man, as indeed it seems ordained to come to his every work soon or late. And this is how the deluge came, so far as a record has come down to us.

A century and a half, or more, after Al Mamoun quarried out his ragged way into the Great Pyramid, and first of men in historic times made known the interior structure of the edifice, that is about the year 1000 A. D., the Caliphs of Cairo began

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the systematic pillaging of all the pyramids, as suited their turn. They wished to enlarge and adorn their capital city; and it seemed to them a great deal more reasonable to take the stones with which to effect their designs from what appeared to their conceit these useless monuments of the folly of the ancients, which were only six miles away, rather than to go one hundred and twenty miles away, to the quarries where the original workmen got them. They were incapable of the slight modesty of thinking that perhaps the men who knew enough to construct such immense masses in perfect geometric forms might have uttered in their work thoughts of corresponding worth, which some generation might yet arise that would be competent to understand and interpret. So in their high conceit, at it they went, and attacked the pyramids nearest them, being the three of which the Great Pyramid is the chief. Thus it came about that for ages the pyramids were the quarries for all builders in Cairo, and so continued until not a stone was left in sight which builders could use, save only a cluster which forms the point of the second one, which, for some reason that cannot now be guessed, the despoilers left like a bunch of fruit on a topmost bough in air. Thus the pyramids came to ruins. But the night wore on, and day drew near in due time.

The morning star of modern times for the Great Pyramid arose when Professor John Greaves of Oxford, England, visited it in 1638. Clearly he was the first of moderns who had any adequate sense of what that vast edifice might be. Himself a mathematician of exceptional excellence, and having the spontaneous instinct of mathematical forms in his soul, he was the first man, apparently, in historic times who felt the real force and meaning of the Great Pyramid's geometric shape, and as the first one built, and so the one that set the type saw that the only rational theory concerning it was that it had a corresponding, that is a mathematical, origin. Certainly he was the first person mentioned in history who approached it with a scientific spirit and brought suitable instruments to measure it with. And until since Mr. John Taylor's publication of the clue to the construction of the building, no more choice measurements than his were made. But as his good work has received full

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notice in a former number of this Magazine, we omit further comment. And what historic facts we mention further will be only the more important incidents, which are of distinct value in Pyramid history.

Visitors and measurers, few and of little value, came to the pyramids from time to time; but it was a hundred and twenty-five years after Professor Greaves' epoch-making visit before any thing occurred that calls for notice here. But in the year 1763, a notable Pyramid event occurred: for in that year a Captain Davison, of the British service, dug his way through from the top of the upper (*i. e.* the south) end of the grand gallery level to the space over the king's chamber, and found the lowest of the five chambers of construction. And this was of value not only because it added to our knowledge of the structure of the building, but also because it led to the discovery of the other chambers of construction with all the important knowledge they disclosed.

The next event of note was the advent of the French under Napoleon, in 1799. Save only Professor Greaves, these were the first men in historic times who approached the building in the true scientific spirit; and brought to bear upon the investigation of it that disposition for accuracy and acute examination, which are the glory of modern science and which render correct knowledge possible. They especially observed with what extraordinary accuracy the Great Pyramid is oriented, or set true to the four points of the compass. They also measured many parts with great care; but their only discovery was that of the two northern corner sockets, which they dug down to and so disclosed. This was of great importance, however, as it showed that the size of the building on the ground originally was considerably greater than moderns had known, and led the way to the discovery of the other two sockets, and the final ascertainment of the true base.

The next event of importance was the work of Signor Caviglia, who in 1818 cleared out the descending passage from where the ascending passage branches off to the lower chamber, which until this date was unknown to moderns. On the contrary, the downward passage and chamber therefrom were all that

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were known to the ancients, the whole system of rooms and passages in the upper part of the building having been carefully concealed by the builders, so that all knowledge of them was soon lost.

And now we come to one of the greatest events in Pyramid history. In 1837, Col. Howard Vyse, a man of large means from England, spent seven months and a fortune in exploring at the pyramids, not only at the Great Pyramid, but at the others also. He found and cleared out the ventilating tubes of the king's chamber. Also, starting with Captain Davison's chamber of construction over the king's chamber, he dug out upward and discovered all the other chambers of construction, showing with what elaborate pains the builders had protected this room from the pressure of the superincumbent mass, and so showing that this room was the chief thought and care of the builders. In the upper of the four level chambers of construction, on the under side of the granite beams which form the ceiling, Col. Vyse found in the rude quarry mark of the workman who wrought the stone the name of the Egyptian monarch under whom the building was erected; and it is the same as that given by Herodotus, though it is of course in the Egyptian form, Shoufou, instead of the Greek form, Cheops. In some respects this is the most important disclosure or revelation that has been made. But in other respects his greatest discovery, and in fact the most important of all that have been made, was that of the two casing stones *in situ*. It was from these two stones standing side by side, that the angle of the slope was derived, from which the clue to the whole geodesical problem of the building was obtained. He himself had no idea of the importance of the angle of those stones, and gave them a fair measurement only, but not a most refined measurement to the tenth of an inch as the case required. But to the measurements, such as they were, was due more than to any other one fact the subsequent discovery by Mr. John Taylor of the geometric proportion embodied in the very form of the edifice. And to this man's most memorable and precious work we now come.

Early in December, 1859, there appeared in England the most

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extraordinary work which, up to that time, had ever been published concerning the Great Pyramid, it being the first attempt to explain the building upon a scientific basis which had ever been made. The work was entitled 'The Great Pyramid; Why was it Built? And who Built it?' The author was a Mr. John Taylor, till then unknown to fame, though of high esteem in the important position which he held. He was publisher to the London University, and had been for at least a quarter of a century. He was then eighty years old, and had been studying the subject thirty years. In this book was given the condensed results of his thirty years of study, namely, the clue to the whole problem of the building, with some parts of the solution.

The two fundamental propositions of Mr. Taylor were one concerning the nature, the other concerning the structure of the Great Pyramid. Concerning the nature of the building, Mr. Taylor taught that it was a strictly scientific structure, containing the elements of a system of weights and measures in terms commensurable with the earth, stated in geometric proportions. Concerning its structure he taught that it was so shaped that its height was to twice its base as the diameter of a circle is to its circumference. He also gave many reasons to show that there was an intimate and organic relation between our English system of weights and measures and the Pyramid itself. This book fell into the hands of C. Piazzi Smyth, astronomer royal for Scotland, who was thereby drawn to Mr. Taylor as his especial and chosen pupil, and to whom he finally left the whole subject in charge.

In the spring of 1864, Mr. Smyth published a book entitled, 'Our Inheritance in The Great Pyramid,' a most significant title indeed, and declaring that our whole system of weights and measures was inherited by us either from that building or from those who built it. This work made so much impression that a gentleman provided a sum sufficient with his own means, so that Mr. Smyth was able to go to the pyramids that winter, and spend four months examining and measuring. He was the first of men in historic times who approached the building having the certainty of what it was, and the clue to work by in

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studying it. Never was it so thoroughly and accurately measured. And so excellent was his skill that the most of his measures are not questioned, but are accepted as undoubted data to work from; and those that are questioned are mostly so because he had not sufficient means to make all his work sufficiently thorough. The results of this work he published in three stout octavo volumes entitled 'Life and Work at The Great Pyramid.' The French had found two corner sockets. He uncovered them and found the other two also. He found also the long trenches in which the builders had laid out the angles, and a place in the rock where the trial form of the ascending and descending passages had been worked out.

Upon his return the whole subject became open to large and earnest discussion; and in addition to the scientific features, a deep religious movement making the building a divinely ordained, prophetic record of God's great Messianic work, both before the advent of our Lord and after, including a distinct announcement of that event has been developed. This brings us to such recent times that a further account does not seem to be required.

JESSE JONES.

THE REFORM OF THE CALENDAR.

The INTERNATIONAL STANDARD for May has been received and read with deep interest.

Not being very well versed in the higher mathematics of Pyramid lore, and only a novice in the new Pyramid-faith, I do not fully understand all I read, nor can I accept all I believe to understand, but I can appreciate the sincerity of each writer, can feel the truth and catch the enthusiasm manifested on nearly every page, and am in full accord with the general aims of the International Institute, a membership in which I consider a great honor.

How strange that, with all our present facilities of communication and dissemination of news, a regular reader of the daily

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papers like myself should have remained ignorant of the existence of our Society for more than five years, and become acquainted with it only a few months ago by sheer accident or—the design of Providence?

Of old it has pleased Jehovah Jireh, among whose wondrous works I now count the Great Pyramid of Jeezeh, to select obscure and lowly instruments to work out His designs; and now I verily believe that He has chosen me to become a disciple of the new faith and science of applied religion which has already claimed its martyrs in Czar Alexander II and President Garfield.

It therefore looks to me like design rather than accident that we should have remained strangers so long and worked independently in different directions for the same end; but now that I have found you, and you have accepted me as a co-worker, I deem it my privilege and duty to assist you in the unveiling of Isis and some of the great problems of life propounded by the Sphinx before that venerable "altar and pillar to Jehovah," and enduring monument of Liberty "guarding historic right" in the midst of the house of bondage.

With a hearty hand-shaking and cordial greeting to all members of our Society, I will at once assume my special place therein and enter upon my special work, which is to earnestly labor with you for *the substitution of the Pyramid calendar for that of Julius Cæsar and Pope Gregory XIII*, as a first and most feasible step toward a universal adoption of all the other just weights and measures, the eternal and unalterable standards of which Jehovah Jireh has provided and preserved in the Great Pyramid of Jeezeh.

I claim this as my special mission, entrusted to me by divine Providence about a year before the memorable meeting at noon of November 8th, 1879, in the old South Church at Boston, the time and birthplace of the International Institute.

It did not come to me in a vague dream of the night, nor in a burning bush under the thunders and lightnings of Sinai, but is the gradual outgrowth of years of hard personal experience and quiet observation of natural and social phenomena.

Discouraged by many failures of honest endeavor, and de-

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barred from the consolations of religion and Christian fellowship, I had plunged into the study of astronomy, seeking refuge from the disorders and confusion round about me in the grand order of the universe, and the sure testimonies of the Lord whose glory the heavens declare.

While thus engaged, a friend brought me Professor Simon Newcomb's new book on popular astronomy, one day in the fall of 1878, in the perusal of which I became at once deeply interested.

One morning thereafter I went to town, a few miles distant from my home, musing over the last sentence on page 50 of that book, which is as follows: "As the end of the century approaches, the question of making 1,900 a leap year, as usual, will no doubt be discussed, and it is possible that some concerted action may be taken on the part of leading nations looking to a return to the old mode of reckoning."

By old mode of reckoning Professor Newcomb evidently meant the "old style" or Julian calendar still in use in Russia, in which calendar every fourth year, including every secular year, is a leap year of 366 days, whereas according to the Gregorian reform thereof, which dropped ten days from the month of October, A. D. 1582, and suppressed three out of four secular leap years, thus adding only ninety-seven instead of one hundred days to the common year in the course of four centuries, the year 1900 should be a common year of 365 days.

By this reform the vernal equinox was restored from March 11, 1582, to March 21st, in 1583, and the average length of the calendar year was reduced from 365.25 days to 365.2425 days.

Arrived at the Fort Dodge Postoffice, I got a Chicago *Tribune*, as usual, and strange to say, the very first paragraph which attracted my attention was a telegram from St. Petersburg announcing that a congress of savans had been called by Czar Alexander II, to meet at some early date in 1879, to consider, among other proposed reforms, the question of adopting the Gregorian calendar.

It struck me at once as exceedingly strange that our superintendent of the Nautical Almanac and Czar Alexander should both be dissatisfied with their respective calendars and propose

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Covering as they do a vast area, the aims of the Society are purely cosmopolitan in character. The benefits to be derived by and through the success of its efforts, are of incalculable importance to the Nations, and the commercial world in particular, hence it should receive the undivided attention and support of every thoughtful and scientific mind in the land ; while its main work in stemming, and ultimately destroying the fallacy called the French Metric System, is succeeding beyond our most sanguine hopes. See letters from Piazzi Smyth, Astronomer Royal of Scotland; Abbé Moigno, Canon of St. Denis Cathedral, Paris ; many important Scientists in England and Ireland, and in our own land.

All in favor of advancing the truth, as portrayed in the revelations of the Great Pyramid of Egypt, and for the success of the Society in preserving inviolate the Anglo-Saxon Weights and Measures, will kindly communicate with the President, by whom all subscriptions, donations and communications will be gratefully received.

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to swap horses instead of trading off their jaded studs for something new.

The Pyramid was then unknown to me, but one of the fundamental thoughts of its architect then and there began to loom up dimly through the mists of ages above the horizon of my mind.

The relation of the calendar to the general laws and customs of society involving the problem of finding a better way of equating unequal measures of time and space, as well as unequal conditions of life, began to possess and perplex me.

Any sudden and violent change was clearly not desirable. The Republican calendar with its *sanscullotites* at the close of the year, and its three decades of each month abolishing the week and Sabbath day, had been tried and condemned by history, but that other *enfant* terrible and universal levelling rod of the French revolution, the metre, was still marching on triumphantly, conquering nation after nation of the old world as well as the South American Republics, and was then just getting ready to capture us too.

I felt that something ought to be done to arrest the spread of French ideas of equalization upon this continent, but what could I, an obscure private citizen, do single-handed in a matter of such magnitude and far-reaching consequences?

Well, I could write to our member of Congress and to the editors of our local papers, and so I did—but I am anticipating my story.

Not the metre, but the calendar was then uppermost in my mind, and various suggestions presented themselves. Professor Newcomb's proposed return to the Julian calendar involved nothing more serious than the addition of a single day to the year 1900, while the Czar's proposed adoption of the Gregorian calendar necessitated the dropping of twelve days, which, in the then existing temper of the Russian people, might lead to more serious riots than those accompanying England's passage from the old to the new style in 1752; the change, therefore, if made at all, should be made gradually. I thought, for instance, by dropping one day from each month of the year 1880, instead of dropping all twelve days at once; or better yet—why not

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drop the additional day of the leap years only, and thus effect the desired transition in fifty years, instead of one year or one day?

With this thought in my mind I reached home again that same day, read a few more pages of Newcomb's Popular Astronomy, and, before retiring to bed, took up once more my much-neglected Bible, and as I was sometimes wont to do in more credulous bygone days, when in perplexity and doubt about anything, I opened the Word of God haphazard for direction. The very first verse my eyes lit upon was the tenth of the twenty-fifth chapter of Leviticus: "And ye shall hallow the fiftieth year, and proclaim liberty throughout all the land unto all the inhabitants thereof; it shall be a jubilee to you, and ye shall return every man unto his possession and ye shall return every man unto his family."

Preoccupied as my mind then was, my eyes dilated as I read these words. I read and re-read the whole chapter, and every line of it came down on me like a new and direct revelation from on high. Turning over to the New Testament, my finger pointed to this most significant verse: "There remained therefore a rest to the people of God" (Hebrew iv, 9), and with this I retired to bed at a late hour of that eventful day toward the close of the year 1878.

The next morning everything was clear to me, and I formulated my new commission as follows:

Be it enacted, etc.:

I. That from and after the first day of January, A. D.——, all years shall be counted at 365 days, except each fiftieth year, which shall be counted at 377 days, and shall be called a year of jubilee, and except each tenth jubilee, or five hundredth year, which shall be counted at 378 days, and shall be called the great jubilee.

II. That the year shall be divided into twelve months, of which the third, sixth and ninth shall have five full weeks of seven days each, the twelfth month five full weeks and one day, and all the other months four full weeks each, except in each year of jubilee, in which one day shall be added to each month

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of the year, and in the great jubilee, in which an additional day shall be added to the last month of the year.

III. That the twelve additional days of each fiftieth year, and the thirteen additional days of each five hundredth year shall all be Sabbath days, and that in these years each month shall begin and end with a Sabbath day.

On the 3d day of January, 1879, I sent a copy of the above bill to the Hon. Addison Oliver, M. C., in a letter concluding as follows: "It is not likely that our present Congress will pass this bill, nor desirable that the proposed change, if adopted at all, should take effect before the first day of the twentieth century, which begins with a Monday and a new moon, but for the simple purpose of calling timely attention to this important subject, I beg you to present it to the House, have it read, printed, and referred to the Committee on Coinage, Weights and Measures, which, I am sorry to see, has recently reported in favor of the adoption of the French metric system. Last year an attempt was made to establish a common ratio between gold and silver as a uniform measure of value. This year Russia is moving to reform the Julian calendar, and hence a proposition on the part of the United States to reform the Gregorian calendar seems to me opportune, as a uniform measure of time is the most important and fundamental of all measures."

In the same month of January, 1879, Hon. Addison Oliver did present the above bill to the lower House of Congress. It was read, printed, and referred, duly ridiculed by the daily press and pigeon-holed by the Committee on Coinage, Weights and Measures. But my preliminary object was accomplished, my bark was fairly launched upon the great ocean, and now that I have become a member of your Society and a reader of the INTERNATIONAL STANDARD, I rejoice and am exceedingly glad to have been permitted to do what I then did, and with your aid I now hope to accomplish my stated mission and live to see the Pyramid calendar a duly enacted law of the United States of North America and of the whole civilized world. I call it the Pyramid calendar because it is plainly annunciated in the base of the Pyramid, iterated in the queen's chamber and grand gallery, reiterated and emphasized in the king's chamber and

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in the chambers of construction, and will yet prove to be the passport out to all other as yet undiscovered chambers, as I now believe and hope to demonstrate in some future letter.

But for a rainy day this letter would not have assumed the formidable proportions it has, and yet my tale is not yet half told, but for the present I must defer its continuance.

F. HESS.

THE ALTAR AND PILLAR TO JEHOVAH.

V.

Every aspect of the Great Pyramid, though involved in every other, is of sufficient importance to demand separate consideration. This has been accorded the view of it as an altar, and as a tower, and must now be accorded it as a treasury, notwithstanding the much that has been said on this subject incidentally in my identification of the Great Pyramid with the Great Tower. By virtue of its interior, and of the treasures deposited therein, a pyramid constituted a treasury; by virtue of the refuge found therein it constituted a hold or stronghold; and by virtue of the presence therein of the deified hero to whom the treasures belonged, including his body, the most precious treasure of all, it became a sacred shrine, a memorial altar, a house of God, a gate of Heaven, a temple of the Holy Spirit. For the sake of clearness, let us take up, in the order of succession, the steps of progressive development here indicated, and see to what conclusion they will lead us in regard to the greatest of the Great Pyramids of the world, that of the pastoral Prime Minister of Cheops and Cephren.

In the first place, the primary object of a pyramidal tower being a treasury, the entire structure was subservient to its interior; and this being called in the Old Testament "the secret place," the structure which encompassed it as the guardian of its treasures was sometimes called "the secret place," as well as sometimes "the treasury." A case of this kind occurs in

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the twenty-fourth verse of the fifth chapter of Second Kings, where the word translated "tower" in the text is translated "secret place" in the margin. Here "the tower," in whose "secret place" the servant of Elisha bestowed his ill-gotten treasures, was clearly a treasury. According to the translation he "bestowed them in the house," but anyone can see that this means a chamber in the tower and not the residence of his master. The profanation of depositing these ill-gotten treasures in the secret place was similar to that concerning which it was said by the Levites to the people, "Cursed be the man that maketh any graven or molten image, an abomination unto Jehovah, the work of the hands of the craftsman, and putteth it in a secret place." (Deut. xxvii, 15.) Therefore Elisha said to his servant, "the leprosy of Naaman shall cleave unto thee, and unto thy seed forever"; and Gehazi went out from the presence of his master "a leper, as white as snow." Apparently of a treasury consecrated to Jehovah, in the figurative sense of the language, Jehovah says to Israel, "As for the beauty of his ornament, he set it in majesty; but they made the images of their abominations and of their detestable things therein: therefore have I set it far from them. And I will give it into the hand of the strangers for a prey, and to the wicked of the earth for a spoil: and they shall pollute it. My face will I turn also from them, and they shall pollute my secret place: for the robbers shall enter into it, and defile it." (Ezek. vii, 20–22.) To some extent in the literal, but chiefly in the figurative sense of the language, God said to Cyrus, "I will give thee the treasures of darkness, and hidden riches of secret places, that thou mayest know that I, Jehovah, who call thee by thy name, am the God of Israel." (Isa. xlv, 3.) And under the figure of the Great Treasury, the Great Pyramid itself, if I mistake not, the Psalmist says, "He that dwelleth in the secret place of the Most High, shall abide under the shadow of the Almighty. I will say of Jehovah, He is my refuge, and my fortress: my God; in him will I trust." (Ps. xci, 1, 2.)

This leads me to my second position—that by virtue of its interior as a refuge a pyramid constituted a hold or stronghold. Of this the Psalmist had sufficient literal experience to furnish

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ground for the lofty figurative language just quoted, in which he appears to recognize the Great Pyramid as a symbol of Jehovah. From the cave of Adullam, which in the fifty-seventh Psalm he calls a "refuge," symbolizing "God Most High," David fled to a similar refuge called "the hold," in the capital city of the King of Moab; and what could this "hold" have been but the interior of a tower, like the cavernous interior of a mountain? After this "David abode in the wilderness in strongholds, and remained in a mountain in the wilderness of Ziph." (1 Sam. xxiii, 14.) The passages showing the likeness in character and use between a cave in a mountain and the hold in a tower, justifying the old designation of the pyramids of Egypt by the term "Pharaoh's mountains," are numerous and striking. "Because of the Midianites the children of Israel made them the dens which are in the mountains, and caves, and strongholds." (Jud. vi, 2.) That the artificial mountains of the ancients were like natural mountains in offering their cavernous interiors for the concealment and safety of refugees, as well as of precious treasures, is exemplified in "the tower of Shechem," from whose interior, called "the house of Baal-Berith," the men of Shechem took the "three score and ten pieces of silver" for Abimelech, the slayer of the "three score and ten sons" of Gideon, wherewith he "hired the vain and light persons who followed him"; for in the same chapter (the ninth of Judges) this treasury stronghold is spoken of as "an hold of the house of the god Berith," into which "the men of the tower entered" when they heard that Abimelech and his followers had already slain the inhabitants of the city and were approaching the tower. The city appears to have encircled the lower section of a wooded hill in a wide part of the valley, between Mount Ebal and Mount Gerizim, while the citadel occupied the summit, and was built of timber rather than of rocks; for it is said that Abimelech and his men, in their ascent, cut down boughs, with which they "set the hold on fire, so that all the men of the tower of Shechem died also, about a thousand men and women." Nevertheless, it is evident that the fighting place of the tower was its outside, and this requires us to believe that it was "built in steps, battlement-wise," like the Great

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Pyramid. The fate of the men who entered into it to escape the vengeance of the man whom they had expelled from the city illustrates the fatality of trusting in a false god. In contrast with it is this in Nahum: "Jehovah is good, a stronghold in the day of trouble, and he knoweth them that trust in him," (1, 7); also this in the Psalms: "Lead me to the rock that is higher than I; for thou hast been a shelter for me, and a strong tower from the enemy," (lxi, 2); and this in Proverbs: "The name of Jehovah is a strong tower; the righteous runneth into it, and is safe," (xviii, 10). If in all the world there is a more fitting basis for these figures of speech than the Great Pyramid, what is it? In Jeremiah the true God, in contrast with false gods, under the symbol of what seems to me the Great Pyramid, as being now revealed to the Gentile world, is presented as the true object of confidence, in a single paragraph, which is this: "O, Jehovah, my strength, and my fortress, and my refuge in the day of affliction; the Gentiles shall come unto thee from the ends of the earth, and shall say, Surely our fathers have inherited lies, vanity, and things wherein there is no profit. Shall a man make gods unto himself, and they are no gods? Therefore, behold I will this once cause them to know mine hand and my might; and they shall know that my name is JEHOVAH." (xvi, 19–21.) "There be gods many and lords many," but only one Jehovah, and this we are to learn once for all from the Great Pyramid.

It is said that the word Baal "means *Lord*, but not so much in the sense of Ruler as in that of *Master*, *Owner*, *Possessor*"; also that Beri means *son*, and Berith *covenant*. I therefore think it highly probable that "Baal-Berith," to whom the Shechemites dedicated their treasury-stronghold, and who was worshiped by the Israelites after the death of Gideon, was the deified builder of what may be regarded as the oldest treasury-stronghold in existence, that of Cain, which he built in the desert "on the east of Eden," and "named after his son Enoch." For reasons to appear hereafter, I think he built it on the top of a mountainous rock in Arabia Petrœa. Good Hebrew scholars say that what Cain built was not "a city" but "a citadel." As such, it was the nucleus, and in a manner the representative, of the

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city that was to gather about it, beginning at the base of the conical hill, and growing upward and inward toward the summit, on which stood the center of attraction. That this is not a purely gratuitous assumption, in respect to the principles involved, is seen in the parallel case of "the stronghold of Zion," taken by David from the Jebusites, concerning which it is said that he "dwelt in the fort, and called it the city of David," and "built round about it, from Millo and inward." (2nd Sam. v, 9.) In the days of Abraham, and long afterward, the mountainous land of Canaan was chiefly divided up into petty kingdoms, each consisting of little more than a fenced city on a conical mountain, growing from the circumference towards the citadel in the midst; so that the great majority of the inhabitants of a kingdoms were "citizens," in the literal sense of the word, and not in the conventional sense, as now. Civil governments, therefore, not excepting the great empires of the world, such as Egypt and Assyria, whose vast alluvial valleys and plains favored both the ambition and the power to merge many diverse kingdom into a complex kingdom, are in the prophets referred to under the symbol of mountains, while the ecclesiastical governments, inseparable from the civil in the theocracies of those days, are referred to under the symbol of cities clothing the mountain sides. The artificial mountains of the ancients, *i. e.*, the citadels, had the same significance as the populous, natural mountains on and in the midst of which they were situated, just as the capstone of the Great Pyramid had the same significance as the Pyramid as a whole. We may therefore readily admit that citadels nominally represented cities in the case of Pi-Thom and Ra-Amses, as a citadel represented "the city of David" in the case of "the stronghold of Zion." On the same principle the Great Citadel, the "altar to Jehovah in the midst of the land of Egypt," represented Egypt, the populous kingdom or city in the midst of which it was situated; so that by the "coffin in Egypt" may reasonably have been meant the coffer in the Great Pyramid. The occupation of this coffer in the pyramid "Aramœus" by the body which "such a man" as Joseph had once occupied, like the occupation of the new sepulcher of Joseph of Arimathea by the dead body of the Christ, did not

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profane it, but rendered it all the more sacred. It changed the stronghold of the man present in the body, and that of his treasures of gold and silver and precious stones, into a memorial altar, a shrine sacred to the memory of his heroic virtues and achievements, and to the preservation of his precious remains, his sacred relics, the ruins of that noble temple which had been the revered abode and beloved manifestation of the spirit.

The fact that natural mountains preceded the artificial in offering their places of refuge for places of sepulcher, we see in the tombs of the patriarchs. Sarah and Abraham, Rebekah and Isaac, and Leah and Jacob, were buried near Hebron, probably on the side of "the mountains of Judah," in the cave of Machpelah, or the double cave which Abraham bought of Ephron, the Hittite, for "the possession of a burying place." (Gen. xxv, 10, and xlix, 29-31.) "And the bones of Joseph, which the children of Israel brought up out of Egypt, buried they in Shechem, in a parcel of ground which Jacob bought of the sons of Hamor, the father of Shechem, for a hundred lambs, and it became the inheritance of the children of Joseph." (Joshua xxiv, 32.) It had belonged to "the sons of Hamor" in the sense that Hamor had intended it for a primogenital burial place, under a law like that of the Hebrews, I suppose; but no doubt the business transaction was between Jacob and Hamor. And I think that this "parcel of ground" was not a *plot* of ground such as a man purchases for his family burying ground in a cemetery, but a literal "parcel," in the sense of a *package* composed of a mass of earth and containing a treasure of some sort, or enclosing a vault for the reception of a treasure, like a certain style of tomb in our modern cemeteries, packed about with earth, in the form of an Indian mound or diminutive teocalli, overgrown with grass on all sides except the stone facade with its door for entrance. Joseph being such a pre-eminent type of the Saviour in his humiliation and exaltation, in his forgiveness of his enemies, in his return of good for evil, in his spotless purity, in his wisdom and love, in his deep and overflowing sympathy, and in the wonderful salvation from death wrought through his instrumentality, I must think that the "parcel of ground" bequeathed him by his father contained

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"a sepulcher hewn out of a rock" in imitation of a cave in a mountain, "wherein man never was laid," not even Joseph, but his bones, to prophesy the resurrection. This "parcel of ground" had been purchased by Jacob from Hamor and recaptured by Israel from the Amorites nearly three hundred years before its appropriation to the final and sole use for which Providence intended it; and on no other theory than that it was set apart for sepulchral purposes, and that the Shechemites were half Israelite, being the descendants of Shechem and Dinah, can we account for its having been preserved inviolate for so long a time. "Jacob's well" and "the parcel of ground that Jacob gave to his son Joseph," where Jesus met the "woman of Samaria," were side by side, and the woman who "had had five husbands, and the sixth was not her husband," was just the sort of woman to have descended from the loving but unlawful relationship between Shechem and Dinah, on account of which Simeon and Levi, in their zeal for purity, so treacherously and cruelly murdered both Shechem and his people. The fact that the Shechemites were of such a loving and forgiving disposition as not to avenge so foul a murder and such a dishonorable breach of a solemn convent, explains the character of "the good Samaritan." And but for the adultery with which the tribe of Dinah, so to speak, was tainted at its fountain head, and with which it was pervaded throughout, as represented in the woman of Samaria—but for this, in connection with the preliminary commission of the Christ to his disciples, "Go not into the way of the Gentiles, and into any city of the Samaritans enter ye not, but go rather to the lost sheep of the house of Israel"—I might think that the fourteenth tribe of Israel, prophetically represented by the top stone of the pyramid of whole stones, is the tribe of Dinah, as suggested by a lady correspondent of our Society, instead of believing it to be the tribe of Joseph by the "issue" to be born to him after Ephraim and Manesseh, which I take to be the Coptic population of Egypt, whose ancestors of the days of the Apostolic Church, besides being among the first to embrace Christianity, were first and foremost in carrying its principles of purity to the extreme of celibacy and monasticism.

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The privilege of burial in a pyramidal tomb was so evidently a birthright inheritance that I challenge proof to the contrary. But for the decree, "In Isaac shall thy seed be called," Ishmael, rather than Isaac, would have been buried in the mountain cave with his father Abraham; but for Esau's sale of his birthright to Jacob, he, rather than Jacob, would have been buried in that cave; but for Laban's dishonorable substitution of Leah for the promised Rachael, Rachael, rather than Leah, would have been laid in the cave which was to receive Jacob; but for Reuben's forfeiture of the birthright by his incest, he, rather than Joseph, would have been the inheritor of the "parcel of ground" intended for sepulchral purposes; and but for Jacob's adoption of Ephraim and Manasseh for his own sons, Joseph would not have been the first and last occupant of that precious parcel, but Manasseh, his first-born, would have shared it with him.

Israel, in his bequest of this "parcel of ground" to Joseph, calls it "the one portion" (in the original "the shoulder," probably, say the commentators, on account of its shoulder-like figure,) "above his brethern," and refers to it as having been taken by himself from the Amorite with his sword and his bow (Gen. xlviii, 22), implying that after his purchase of it from Hamor, the prince of the Hivites, it had been captured and garrisoned by the Amorites as a stronghold at some period of the fourteen years between the date of Joseph's being sold into Egytian bondage and the date of his removal of his father and brethren to Egypt from the famine in the land of Canaan—an interval of time exclusively occupied by the sacred historian in narrating the story of Joseph. The circumstance of its capture and recapture by force of arms, shows how easily the place of sepulcher could revert to its original use as a treasury-stronghold, and how easily it could be reconverted into a sacred depository of the mortal remains of the inheritor of the birthright. In the eleventh chapter of First Chronicles is mentioned "a parcel of ground full of barley," evidently not a field of growing barley, but a depository of grain in the form of a pyramidal hill, "in the midst" of which stood the mighty Eleazar and his men, as it were "in the midst of Mars' hill," to prevent its capture by the armed Philistians, who were bent

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on plundering it of its contents. Naomi's "parcel of land" (Ruth iv, 3), the property of her dead husband Elimelech—and after him the property of her childless sons, Chilion and Mahlon, all of whom died in the land of Moab—was evidently of no value for cultivation, but was a birthright possession, dedicated to the burial of the first-born son in a limited series of generations, and therefore requiring to be "redeemed" by the marriage of the childless wife of the deceased Mahlon to his nearest kinsman, to raise up to him the lawful inheritor of his inalienable possession. From this redemption of a birthright inheritance, involving, as it did, the espousal of Ruth to Boaz, came the Great Redeemer, the Lamb of God, who hath purchased with his own blood, and by "the marriage of the Lamb" to "the Lamb's wife" will seal "the heathen for his inheritance and the uttermost parts of the earth for his possession." To this "the only begotten and well-beloved Son of God" humbled himself; for his is the great birthright by the law of primogeniture, the inheritance of the world by the right of "the first-born among many brethren," prefigured by the inheritance of Isaac and Jacob in the cave sepulcher of Abraham, and more especially by that of Joseph in the hewn out sepulcher bequeathed him by Israel; and why not prefigured by the inheritance of the children of Joseph in that symbol of the world of matter and of mankind, the "altar of Jehovah in the midst of the land of Egypt?" This world is a great "whited sepulcher, full of dead men's bones, and all uncleanliness," of which Christ Jesus is "the Resurrection and the Life;" and why need any one feel shocked at the idea that the Great Pyramid, in order to represent such a world more perfectly, once contained in its sarcophagus, in its most interior and wonderful apartment, the dead body of its inspired architect?

In keeping with the idea that "the parcel of ground" in which Joseph's bones were interred was a sort of teocalian mountain, or huge altar of earth, is the fact that their interment therein is mentioned between that of the body of Joshua "on the north side of the hill Gáásh" and that of the body of Eleazar "in a hill that pertaineth to his son Phinehas," as if to indicate the inclusion of art in nature, as being her means to the

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fulfillment of her end in the attainment of her final perfection. For Shakespeare does but echo Nature's children of the early ages when he says, "Nature is made better by no mean, but Nature makes that mean; over that art which you say adds to Nature, is an art that Nature makes; and art itself is Nature."

Before purchasing "the parcel of ground," Israel pitched his tent upon it; and there, probably in the midst of its commanding height, he erected the altar which he called "El-Elohe-Israel" (God, the God of Israel.) No doubt the sons of Israel, as well as Israel himself, worshiped at this altar on the great "shoulder" of ground; and to this, it seems to me, rather than any temple on Mount Gerizim, the woman of Samaria referred when she said to Jesus, "Our fathers worshiped in this mountain; and ye say that in Jerusalem is the place where men ought to worship." For the two places then present to Jesus and the woman, *i. e.*, "Jacob's well" and "the parcel of ground given by Jacob to his son Joseph," were the subjects of their conversation, in their literal character on the part of the woman, and in their spiritual signification on the part of Jesus. To the Samaritan preference for the older place of worship, as compared with the temple at Jerusalem, which the Samaritans ascribed to Medes and Persians, rather than to Israel, Jesus replied, "Woman, believe me, the hour cometh when ye shall neither in this mountain, nor yet at Jerusalem, worship the Father. Ye worship ye know not what; we know what we worship, for salvation is of the Jews. But the hour cometh, and now is, when the true worshipers shall worship the Father in spirit and in truth, for the Father seeketh such to worship him. God is a Spirit, and they that worship him must worship him in spirit and in truth." As the great Teacher had previously unfolded the spiritual meaning of Jacob's well, at the foot of the mountain, where they sat and conversed, did he not here, in what he said of the mountain as a place of worship, unfold the spiritual meaning of that consecrated spot, "the parcel of ground given by Jacob to his son Joseph" for a possession of a burying place? In connection with Jacob's allusion to it as taken from the Amorite with his sword and his bow, it is altogether reasonable to believe that "this mountain" and "the

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parcel of land given by Jacob to his son Joseph" were one and the same. If this be admitted, the teocalian sepulcher of Joseph, at the foot of which the King of the Jews and the woman of Samaria held their conversation, was indeed a "house of God," a "gate of Heaven, "a temple of the Holy Spirit." "Joseph's bones," supposing them represented in the bones of his skull, the dome of thought, the temple of the soul, "were visited" in his life time by an inspiration of the Spirit of Truth, and after death "they prophesied" of the resurrection. (Eccle. xlix, 18). The Jews, especially the Levites, so hated and despised the Samaritans, and perhaps so feared a rising up in judgment against themselves for their cruel hatred and contempt, as to deny that they could have any part in the resurrection from the dead. As if in anticipation of this predjudice, the bones of Joseph were deposited in "the parcel of ground" purchased by Jacob from the sons of Hamor, making "the valley of Achor a door of hope" by their prophesy of the resurrection of the dry bones of the Shechemites slain by Simeon and Levi, and making these bones a symbol of "the whole house of Israel," who had fallen victims to the adulterous mixture of idolatry and the worship of Jehovah practiced by the Shechemites, with whom, as being chiefly the descendents of their sister Dinah, they resided on terms of fraternity and good will. When the "Son of Man" shall prophesy to the dry bones of the valley of Shechem, or of Achor, "O, ye dry bones, hear the word of Jehovah," and to the breath, "Come from the four winds, O, breath, and breathe upon these slain, that they may live," the Jews will see "the publicans and harlots," the "lost sheep," and the Samaritans, "entering the Kingdom of Heaven before them," in the form of "an exceeding great army," with Joseph at its head manning his teocalian mountain and "pressing into the Kingdom of Heaven" in a manner seeming to "take it by force." With the resurrection the great charnel house, which this earth is seen to be, will be reconverted into that great treasury-stronghold, heaven on earth, in the form of the holy city, New Jerusalem, against which "the gates of hell shall not prevail."

The Great Pyramid is called a symbol of this earth, but it is

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not so much this as it is a symbol of heaven on earth, such as the world was "when the morning stars sang together, and all the sons of God shouted for joy," and such as it will be again when the New Jerusalem shall descend "from God out of heaven, prepared as a bride adorned for her husband." For not only Job's description of this world as it was before the fall, but John's description of it as it will be when its redemption shall have been completed, is that of a pyramid. (Job xxxviii, 3-7, and Rev. xxi, 1-27.) In the resurrection, when the redeemed "shall be as the angels of God in heaven," the "altar of Jehovah in the midst of the land of Egypt" will no longer be a shrine sacred to the memory of "the tree of life in the midst of the garden," and no longer a prophesy of its reappearance "in the midst of that paradise of God," the New Jerusalem, but will be lost in the realization and fulfillment of its own significance, as at high noon in mid-summer its shadow is lost in its substance. Heaven on earth will then shine forth as the great treasury-stronghold and temple of the Holy Spirit, where they who have laid up their royal diadems and priestly robes in heaven will find them free from moth and rust, their hearts there also, redeemed from corruption "by the precious blood of the Son of God," and they themselves "kings and priests unto God and the Lamb."

J. W. REDFIELD.

LONG OR SHORT FRACTIONS FOR GREAT NATIONAL STANDARDS.—EARTH'S AXIS OF ROTATION.

In the two last numbers of the "American School of Mines Quarterly Journal," the learned President Barnard, of Columbia College, New York, has involuntarily opened a question of far wider interest than the particular one with which he set out. For on his page 120, there appears the following remarkable statement:

"The length of the polar axis of the earth is a quantity

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which may with strict truth be pronounced to be, up to this time, absolutely unknown!"

Now if that really be so, the people of every civilized country on the face of the earth, who have been taxed during the last hundred years to the extent of millions and millions for the support of magnificent arc-of-the-meridian measuring establishments, have some right in common sense to rise with revolutionary wrath and demand how the enormous sums of their money, given to determine the size and shape of the earth, have been expended. And when shall we know the far greater distance of the sun?

But the statement can only be true on some private interpretation, which is needless to inquire into; for when we take the various lengths of the earth's axis of rotation as determined in modern times, and collected by President Barnard himself from very diverse sources indeed, we find them all to be coincident down to four places of figures at least. And considering that for some other most important national standards the world is apparently content with a certainty of two places of figures only, the officers of the several trigonometrical establishments (including the United States coast survey) of all the countries of Christendom deserve high praise, rather than condemnation, for the results they have thus far succeeded in bringing out.

The mean of their last five measurements, as given by President Barnard for the axis of the earth, is 500492732.8 British inches; the ten-millionth part of which is evidently 50.04927328 British inches, though he has chosen to bring it out as a very different quantity indeed, viz: 49.273 British inches.

But the really important point now to be discussed is whether in practical use as a standard of measure, either on paper or for mechanical work, we should attempt to realize, or wait through ages for the improvement of that long fraction; or may we at once be content with the 50.05 British inches, at which, as quoted by the President, I had years ago ventured to assume the said ten-millionth of the earth's axis of rotation.

In place of merely, and perhaps somewhat vainly, *theorizing* on the subject, let us look to the growth of modern opinion on a much older question, but connected with the same axis of ro-

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tation, viz:—the number of solar days in the tropical year, reckoned now to be 365.2422414 ±; but assumed in the old Julian year = 365.25.

Pope Gregory's reformation of the calendar, by introducing the former—or something like it—in place of the latter quantity, caused sufficient disturbance to all the ordinary affairs of men in every nation when it was first accepted, and has some arguments which may be alleged in its favor still.

But if I read aright a recent tract by so consummate a physical astronomer as Professor Simon Newcomb, he holds that the Gregorian alteration has done so much more harm than good, being quite a needless refinement, and is so totally unsuitable to calculations in physical astronomy compared with the Julian year, that civilized nations should, and will, he says, presently return to that kind of year and its "old style" reckonings, leaving a few curious computers, whom it may concern, to prepare tables of corrections where they are absolutely required for their own abstruse and recondite purposes.

15 Royal Terrace, Edinburgh.

C. Piazzi Smyth.

P. S.—"Nature" journal just arrived, has inserted my letter on the length of the ten-millionth of the earth's axis of rotation, and President Barnard's differing value for the same; and the case forms a good illustration of the importance in applied mathematics, after the existence of anything whatever has been asserted, of asking "how much."

Now, agreeing so far with the President that the mean of five of the best and latest arc-of-the-meridian measures, give for the earth's actual axis of rotation, =500,492,732.8 British inches, then accepting that as the truth, the error of my assumption in all my Pyramid books for the ten-millionth of the earth's axis of rotation, viz: 50.05 of the same inches, is evidently 50.05—50.04927328=.0007 + &c., or only sensible in the 4th place of decimals of an inch.

But if you take President Barnard's value (page 214 of the "School of Mines Quarterly Journal") of the earth's axis of rotation length, viz: 49.273 British inches, the error of that is

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50.04927328—49.273=.776 of an inch, a terrifically large quantity.

So if he has called my Pyramid work a disgraceful break-down in accuracy, what words can be found strong enough to describe his error 1000 times greater?

C. P. S.

GLEANINGS FROM PETRIE'S NEW BOOK,

'THE PYRAMIDS AND TEMPLES OF GIZEH.'

Several years have passed since our Society began to look about for means to send a surveying expedition to Egypt. We have had the conviction that only by a thorough remeasurement of the Great Pyramid could some of its disputed dimensions be settled, particularly the length of its base. But thus far we have been unable to fit out the expedition.

Meanwhile Mr. W. M. Flinders Petrie, a competent English engineer, has made a thorough triangulation at the Pyramid, and elaborate measurements of its parts, and his work has received the stamp of approval by that self-appointed and world-accepted autocrat of modern science, *The British Royal Society*; for we find immediately following the title page of his new book, this sentence standing conspicuous and alone:

Published with the assistance of a vote of one hundred pounds from the Government Grant Committee of the Royal Society, 1883.

The high reputation of Mr. Petrie, enhanced by the masterly manner in which he has made and recorded this survey, the indorsement of the British Royal Society, and especially the pronounced opinions of both the Society and the individual surveyor against our interpretation of the Great Pyramid, combine to give the highest possible weight to any favorable testimony which Mr. Petrie's survey may give us.

What then is the significance of the following gleanings from his report?

THE EGYPTIAN CUBIT CORRELATED TO THE BRITISH INCH.

Mr. Petrie says that "unquestionably" the Great Pyramid

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"takes the lead" of all the other pyramids "in accuracy and in beauty of work, as well as in size"; that the king's chamber "is the most accurately wrought, the best preserved, and the most exactly measured, of all the data that are known for determining the value of the usual [Egyptian] cubit." On page 81 we read: "Probably the base of the chamber was the part most carefully adjusted and set out; and hence the original value of the cubit used can be most accurately recovered from that part. The four sides there yield a mean value of $20.632 \pm .004$, and this is certainly the best determination of the cubit that we can hope for from the Great Pyramid." But on page 179 we find, "But taking the king's chamber alone, as being the best datum by far, it nevertheless contracts upwards, so that it is hardly justifiable to adopt a larger result than $20.620 \pm .005$."

Now, if we take the mean of Petrie's two values, viz.: $\frac{20.632 + 20.620}{2}$ we get 20.626, which harmonizes as nearly as three decimal places will approximate to Mr. Skinner's British inch theory, as interpreted by my π formulæ for dimensions of king's chamber, which give width $= \frac{648}{\pi} = 206.264806+$ (Magazine, vol. 1, p. 25); and this, Mr. Searles shows to be equal to 10 Egyptian cubits. (See Magazine, vol. 1, p. 45.) Hence, if Mr. Petrie's measures are to be trusted, they prove at least the *fact*, if not the *intent*, that the Egyptian cubit of the Great Pyramid and the present Imperial British inch are correlated, so that for one Egyptian cubit measured on the diameter of a circle, 64.8 British inches will be measured on the circumference of the same circle; or, in a circle whose radius is 10,000 Egyptian cubits, the circumference will measure exactly 1296000 British inches, or one inch for every second of arc; making, thus, a quadruple correlation of Egyptian cubits, British inches, modern circular measure, and our decimal system.

BRITISH INCHES RECORD THE LENGTH OF THE MEAN SOLAR YEAR IN THE BASE OF THE GREAT PYRAMID.

On page 39 we read: "This square [whose corners lie on the diagonals of the sockets] of the original base of the Great Pyramid casing on the platform is of these dimensions: N. 9069.4,

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E. 9067.7, S. 9069.5, W. 9068.6—mean 9068.8"; and the mean error given is ±.65. These figures all denote British inches, for in the *Introduction* we read, "All measures stated in this volume are in Imperial British inches."

We are told, too, that the sockets for the corner stones of the Pyramid are at different levels below the pavement, the S. E. socket being the lowest (39.9 inches below the pavement, p. 40); "that the socket corners vary from a true square in proportion to their depth below the pavement, the sockets nearer the centre being higher." "This means that the sockets were cut to receive the foot of the sloping face [of the casing] which was continued right down to their floors, beneath the pavement," and that "the socket corners lie in the diagonals of the Pyramid casing." (See pages 38 and 39.)

Again, as to the angle of slope of the Great Pyramid, we find on page 42:

		WEIGHT.
Casing stone, *in situ*, N. side, by theodolite (to three points on top and three on base),	51°46′45″ ± 2′7″	7.
To three points by goniometer and level,	51°49′ ± 1′	2.
N. face by entrance passage mouth,*	51°53′20″ ± 1′	10.
N. face by air channel mouth,*	51°51′30″ ± 20″	5.
N. face, weighted mean,	51°50′40″ ± 1′5″	
S. face by air channel mouth,	51°57′30″ ± 20″	

On page 43, the author says: "On the whole, we probably cannot do better than take 51°52′ ± 2′ as the nearest approximation to the mean angle of the Pyramid, allowing some weight to the South side."

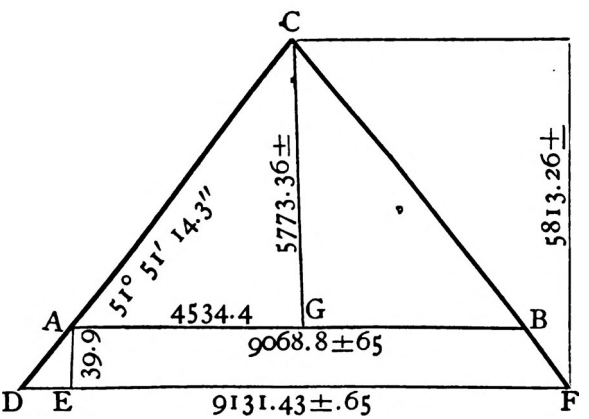
Now, if we turn to page xv. of the *Introduction*, we shall find what Mr. Petrie means by the ± error: "The probable error is an amount on each side of the stated mean, within the limits of which there is as much chance of the truth lying as beyond it—*i. e.*, it is one in two that the true result is not further from the

* Of these two measures, the latter of which differs but 15.7″ from the true π angle, Mr. Petrie says: "The datum for the air channel, though far more accurate than that by the passage mouth (being on a longer length), is not so certainly intentional, and is therefore not worth as much."

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stated mean than the amount of the probable error." Then, since the *true* π angle of slope, 51° 51′14.3″, does not fall without the probable error of Mr. Petrie's 51° 52′ ± 2′, but lies well within it, we see that his measurements confirm John Taylor's theory of the true π proportion of the Great Pyramid as accurately as their limits of probable error permit them to testify.

Let us now calculate the length of the base of the Pyramid at the level of the S. E. socket floor, using Petrie's data already quoted, but substituting the true π angle of the slope.



Radius : 4534.4 :: tang. 51° 51′ 14.3″ : 5773.36=CG. And 5773.36 + 39.9 = 5813.26. Then 5813.26 × $\frac{\pi}{2}$ = 9131.43= DF=base of Pyramid at level of S. E. socket floor. But the probable error of Petrie's 9068.8 being given by him as ± .65, the socket base DF cannot have a less error than ± .65.

Now Professor Piazzi Smyth's theoretical measure of the base is, numerically, 9131.055, which lies much within the limits of probable error of Petrie's 9131.43±65 ; hence, the whole weight of these data from Petrie goes to confirm, but at the same time, apparently, though perhaps not really, to correct Professor Smyth's year length measure of the base of the Pyramid, for the corrected formula will read :—

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$$\frac{\text{Perimeter of base of Pyramid in } \textit{Imperial British Inches}^*}{100}$$

=length of mean solar tropical year, or $\frac{9131.055 \times 4}{100} =$ 365.2422.

Many of our friends have failed to perceive anything more than a mere coincidence in the appearance of the British inch and the modern circular measure in the king's chamber. They have said that my π formulæ † prove ratios only, not dimensions. But what will they say now of the British inch in its record of the year length in the base of the Pyramid? Is it a mere accident that the British inch makes the very record which, of all records, would be the most appropriate one to be made in that most important dimension of the grandest structure ever reared by man?

But we have not yet proved from Petrie that the architect of the Pyramid intended to record the year length to the accuracy of 365.2422 days; yet this must be proved before we can convince the world that the architect was any other than an Egyptian; for authorities affirm that the Egyptians knew the year length to the accuracy of 365¼ days,‡ and Petrie's measures, with their ±.65 error, are not sufficiently exact to discriminate between 365¼ and 365.2422.

Possibly a full mathematical demonstration of the superhu-

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* Instead of Pyramid Inches as given by Professor Smyth.

† See, *The Argument Condensed*, Vol, 1, page 24 of Magazine.

The formula there given for base of Pyramid is $\frac{180^2}{2\sqrt{\pi}} = 9139.871258 1+$; and Rev. H. G. Wood (in vol 1, page 496 of Magazine) has proved from Petrie's "Table of co-ordinates of marked stations," and his record of socket levels, that this is the true distance from corner of S. E. socket to corner of N. E. socket projected at the arris slope to the level of S. E. socket. Mr. Petrie says, page 38, "When the casing was duly projected down at its angle of slope to the socket floors, it was found to fall on an average 4 inches inside the edges of the socket corners." This would make the casing base about 8 inches less than the socket base; and 9139+ less 8 inches is 9131+, just as we have calculated it in the present article. Perhaps a part of the significance of the socket base, 9139+, lies in its diagonals, which may be intended to mark the precessional period. If so, we escape the improbable theory, heretofore held, that a single square measures the year length, the earth's orbit circumference, and, by diagonals, the precessional period. It is also worthy of consideration that 9139.87 British inches are equivalent to 9131.05 Pyramid inches, and may have been intended to mark the year length in Pyramid inches.

‡ See Smith's Bible Dictionary, Article, Egypt.

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man perfection of the Great Pyramid record will very soon be revealed, through the relations of the grand gallery to the Pyramid base. We will consider, therefore,

THE YEAR LENGTH IN THE GRAND GALLERY.

On page 71, the "distance on slope" of the grand gallery from North wall to the "South wall in same line" is given as 1883.6. Now is the following a mere coincidence, or is it intentional?

The corrected base at S. E. socket level, 9131.055, multiplied by the width of king's chamber taken in decimals, *i. e.*, .206264806, (or $\frac{.648}{\pi}$)=1883.415288, or within .2 of an inch of Petrie's measure of the grand gallery floor, and presumably within the probable error which he would allow.†

If the grand gallery is prophetic, and foretells events which are near at hand, expressed in our current chronolgy by means of the modern Imperial British inch, then the course of events may be so distinctly marked, and exactly dated, during this year 1884, as to formulate for us, through this grand gallery floor equation, the exact year length intended by the architect. But I do not care to meddle with questions of unfulfilled prophecy. Let the future decide them.*

CONCLUSIONS.

The builders of the Great Pyramid worked in Egyptian cubits: this is evident from the integral character of their lines, when expressed in cubits, in contrast with the endless fractions which the inches record. I doubt if the Egyptians, or their rulers, ever dreamed of the inch; neither has the British Parliament wittingly correlated the Imperial inch to the Egyptian cubit; ‡ but an overruling Providence seems to have adjusted the one to the other, that the world may have proof, just that scientific proof for which they are incredulously clamoring,

† Petrie does not give the $\pm$ error of this measure.

* Mr Baxendell has objected to the British inch theory, that it does not formulate the year length, either in the Pyramid base or in the grand gallery. Thanks to Mr. Petrie, we now learn how it does both.

‡ Yet possibly a duplex system of measures, having two units, the one diametral, and the other circumferential, may prove to have superiority over a single unit system.

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"That the Most High ruleth in the kingdom of men and giveth it to whomsoever he will." Hence, I believe that Great Britain is destined to rule Egypt, and the British inch is destined to outrival the French metre.

Thus, in a short paper, I have endeavored to glean a few crumbs of comfort from the recent survey of the Great Pyramid, made with so much skill, and favored with so much success, and published with so much *eclat*, and declared by its author to be so crushing to our "Pyramid theories." We sought in vain, as we thought, for means to send an expedition to Egypt, and Mr. Petrie not only furnished the means but did our work for us. We feared that our testimony would not be accepted, even if we should succeed in making the survey, and Mr. Petrie has obtained for us the indorsement of the British Royal Society.

We heartily thank Mr. Petrie for his work, and we sincerely desire that he will hasten to join our ranks; for we do not follow in that sombre procession in which he depicts us,* but we are marching beneath a banner upon which is blazoned this motto: ANNUIT COEPTIS.—"He hath favored our undertakings."

April 30th, 1884. J. H. Dow.

THE TESTIMONY OF THE SOCKETS AND AIR CHANNELS.

In No. 1, Vol. II of this Magazine, "A Review" suggests a substitute for the computation of socket lines as set forth in a previous paper on the "British Mile." In that paper the opinion was advanced that a settling of the Pyramid has taken place centering at a point south and west of the king's chamber and running in a south-westerly and north-easterly direction. "A Review" repeats the opinion, saying, "There has evidently been a settling down of the whole south side of the Pyramid in a westerly direction, the effects of warping, a result that must have arisen from the action of the sun on the southern side."

*See last paragraph of Mr. Petrie's introductory chapter.

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In the computations that follow this statement a deduction of 3.7 inches for warping is made from Mr. Petrie's measure of the south side, and an additional deduction of 1.3 inches, thus assigning to this side an original length of 9118.9 instead of 9123.9 (pp. 52 and 54).

But the south side measure of 9123.9 given by Mr. Petrie is the length of the socket line or distance between fixed points in solid rock which is still covered with about two feet of pavement. How there can have been any extension of the socket lines, I cannot see, except by abrasion of the sockets or fissures in the rock, of which no evidence has been found on the south side.

In assigning to the south and west sides the same length 9118.9, we come in conflict with the best actual measure yet obtained which shows a difference of 4.7 inches in these two sides. However, equality of masonry sides might have originally existed if the builder had left a margin of 2 to 6 inches between the facing stones and the socket sides, but then the sum of the four sides would have been considerably less than 36500. The following table may be convenient for reference and comparisons:

	Level.	Side of Square	Perimeter ÷100
S. E. Socket	00.0	9139.871	365.59484
N. W. "	7.1	9128.719	365.14876
N. E. "	11.4	9121.964	364.87856
S. W. "	16.9	9113.325	364.53300
Civil year	9.4	9125.000	365.00000
Astronomical year	5.6	9131.056	365.24224

A difference of ½ inch in level makes a difference of .7854 in the length of a side, if the angle of the facing be taken as 51° 51′ 14.3″.

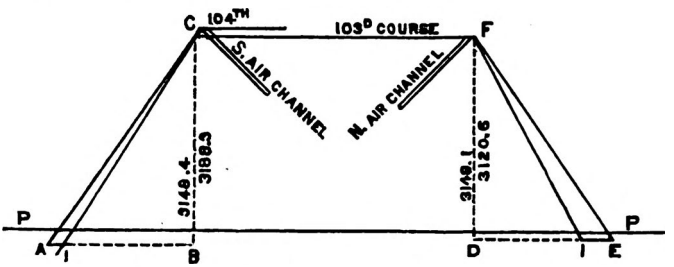
It will be observed in the foregoing table that the astronomical year level is very nearly the mean of the S. E. and N. E. socket levels, and originally it was exactly that if the S. E. corner has settled two tenths of an inch.

It may be interesting to note Mr. Petrie's levels of the courses at the N. E. and S. W. corners. By his table the following courses are pefeetly level at those points, Nos. 5, 23, 25, 34, 38, 39, 46, 68, 126, 127. The average difference in the lower 13 courses is 2.47; from the 13th to the 145th is 67; in the

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upper 56th it is 2.4. Mr. Petrie thinks that the levels of the 1st course show the real error of level in the pavement. The S. W. corner of that course is one inch lower than its N. W. corner. But the pavement at the S. W. corner may be out of level even more than this. We would suppose that more care was taken to level the pavement all around than to level the core courses of masonry. In fact the core courses range from 1 to 5 inches out of level. This was of little importance seeing that they were to be covered with facing stones in such a manner that no courses would be observable.

That a tilt of about 6′ in a southwesterly direction has actually taken place, appears to be capable of pretty clear demonstration by the levels given by Mr. Petrie. The following diagram and explanation will show the line of proof.



BIC=51° 57′ 30″ (Petrie) DEF=51°46′16″.
ACB=38° 4′ 4″ " The mean of DEF and BAC =51° 51′ 5″.
BAC=51° 55′ 54″ "

A, corner of S. E. socket. E, corner of N. E. socket. C, exit of south air channel. F, exit of north air channel. PP, pavement, or zero of levels. II, Mr. Petrie's line of casing stones on the socket floors. AI=2.4, IE=7.8.

The problem is to find the mean of the angles BAC and DEF.

Level of south air channel exit at bottom of 104th course, 3148.4
Level of S. E. socket A., below pavement - - - - - 39.9

Level of south air channel exit above S. E. socket, BC, 3188.3
Angle BIC, (Petrie), 51° 57′ 30″.

From these elements, IB is found to be 2494.733. To this add Mr. Petrie's margin 2.4 and we have, AB, 2497.133. Hence,

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the angle ACB=38° 4′ 4″ and the angle BAC=51° 55′ 54″. By a similar process DEF is found to be 51° 46′ 16″. The mean of these two angles is 51° 51′ 5″. The tilt is one-half the difference in the two angles, ½ of 9′ 38″=4′ 49″. If two-tenths of an inch be allowed for abrasion of socket walls instrumental error, BAC will be 51° 56′ 3″ and DEF will be 51° 46′ 23″ and the mean 51° 51′ 13″, and the tilt would be 4′ 50″, provided that originally the altitude of the north and south sides was the same.

This result seems to confirm the opinion that the facing stones were set close into the corners of the sockets without any margin, and consequently that the time measure of the base sides is not between undefined points on the socket floors but from the very boundary lines of the sockets themselves.

H. G. Wood.

WHAT IS THE PYRAMID INCH?*

I do not know a more pertinent question; probably none has been a greater stumbling block to our Society since its organization, and none has been the handle of so much ridicule of Prof. Piazzi Smyth, astronomer for Scotland, and of all the members of our Society, and many of them, some of the wisest and most technical, the best mathematicians, have succumbed and said that the Pyramid inch is a myth, and that Prof. Smyth would have to recant. He based his whole theory on the assumption that the base of the Pyramid measured 9,140 British inches, and upon the fact that there were certain most remarkable coincidences in time and chronology in the proportions of the Great Pyramid. Assuming that the British inch had become shortened 1,000th part during the last 4,000 to 6,000 years, he declared that the true inch was correlative with the polar axis of the earth, and hence with the measures of the universe, 25 of which should and really did make the cubit of Israel; that the sacred cubit, in contradistinction to the common cubit of Israel, was the Pyramid Inch—25.025 British inches of which

*See page 195, Inquirers' Club.

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make the Sacred Cubit of 25 Pyramid inches, and that this was and is the two hundred and fifty millionth of the polar axis of the earth. He claimed that the polar axis, in all probability, is 500,500,000 British inches, and that by lengthening this British inch 1,000th it would exactly agree with the polar axis, so that 50 Pyramid inches would be the ten millionth part of the axis of rotation, and that 25 Pyramid inches would make the sacred cubit of Israel the ten millionth part of the half axis of rotation. It must be admitted that if this be true, there could be no more beautiful, symmetrical and harmonious relation in the universe than such a measure for a standard of length; for there is and can be but one axis of rotation, whilst there is an infinite variety and number of meridians. There is only one other measure on earth that could come near to it as a proper standard, and that is one circular measure, viz.: the equatorial circumference of the earth, unless it be that when a second of arc is symbolized by the inch.

There are, therefore, two plainly marked, unique earth measures which would be adopted by the wise of the earth for a standard of linear measure, viz.: the straight polar diameter and the curved equatorial circumference, unless from certain other cosmical relations, the measure of the earth in latitude 30° should be selected as a correlative, of which I propose presently more particularly to speak. Now, I wish here to go back four years to the publication of my paper on the "British Inch," and before doing so I desire to say that until I met J. Ralston Skinner, of Cincinnati, I was under the impression that Prof. Smyth's theory was correct that the British inch of to-day was the same as that given originally to our race, except that it had become shortened by 1,000th part. Mr. Skinner implored me to dismiss this thought and accept his, viz.: that the British inch of to-day is the original exact length handed down from generation to generation, and preserved, mysteriously, but yet preserved, intact and exact through thousands of years; that Piazzi Smyth's Pyramid inch was a fallacy—had no foundation whatever. I combated Mr. Skinner, and, when we were about to have the chart made, determined to have it constructed in Pyramid inches. So disturbed was he about this that he asked

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me as a personal favor not to do it, but to construct it according to the measure of the British inch, with which Piazzi Smyth measured; and I finally consented, and then went to work and convinced myself by writing my paper on the British inch, declaring, however, that the Pyramid inch of Piazzi Smyth would be proven true—a result that I have never doubted. The object of this paper is to endeavor to prove the correctness of that thought and the absolute correlation between the British and Pyramid inches, redeeming a promise I then made, to endeavor to show their relation.

I have been looking in various directions ever since, but never came to any definite conclusion until Rev. H. G. Wood, an Episcopal minister at Sharon, Pa., a valuable member, commenced with his papers upon the "British Mile."

I reproduce here portions of my paper referred to:

EXTRACT FROM PROCEEDINGS PART II., AUGUST, 1880 TO JUNE, 1881, PAGE 102.

It is very plain that the most important, indeed the all-important thing to do in measuring an old monument, is to ascertain the intention of the architect. It is perfectly plain, by examining all of the measures given in the authorities, that there is a small discrepancy, for it is stated that the height of the Great Pyramid is to twice its base as 1 is to π, but when we come to put the figures heretofore given in shape we find that it is so, as close as measurement can prove it, showing the positive intention of the architect, but exhibiting most clearly that we have not found the figures that give the proportion. Now, unless we can give these dimensions to the millionth part of an inch, I shall consider the work incomplete. If this structure be of God it will explain itself to the millionth of a second. Such a test will reveal inspiration.

Without it we have only the bungling work of the common mind.

We shall see as we proceed here how far we may be able to prove by the minute tests referred to, the inspiration of the work.

If the coincidence is not perfect all are at liberty to reject it at once, but if the figures are found to prove to the minutest fraction the assertion made, then I call upon the wise men to take notice.

There are three keys in the Great Pyramid. First, the key of pure mathematics, and if in our additions, multiplications, subtractions and divisions we do not find perfect results, then the key of *pure mathematics* is not found.

The second key is that of applied mathematics, or that which relates to the earth and astronomy.

If the measures do not relate to the earth and to the heavenly bodies, then the second key is not found.

The third key is that which relates to past, present and future history. If the application of the measures in an inch to a year is not proved as related to the history of the race, then the third key is not found.

But if these three keys be found, or if the first one even, viz.: that our British inch is found, what is the inevitable and inexorable conclusion. It is this, that the people who

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built the Great Pyramid of Gizeh, were our own forefathers and not idolatrous Egyptians, and that the nation possessing this first key is the British or covenant race.

Now, I propose to confine myself herein particularly to key No. 1, and to all I request, that they make themselves acquainted with the value of π.

I propose in this paper to prove that J. Ralston Skinner, of Cincinnati, has discovered the mind of the architect of the Great Pyramid in relation to the measure used, and that he has absolutely restored the building, as far as he has applied the measure to the original plan to the most minute fractions, and that this measure used is the veritable British inch, in the possession of the Anglo-Saxon race alone.

I also propose to prove that C. Piazzi Smyth, Astronomer Royal of Scotland, the great measurer, has given the theoretical base of the Great Pyramid in British inches, 9,140 inches, upon a certain level from which are deduced the time measures of the Great Pyramid; also that the Pyramid inch is a real thing, but that it relates only to that which is sacred in the Pyramid, hence the sacred cubit, of 25 P. inches, is about one thousandth greater than the British cubit of 25 inches.

I propose to prove that J. Ralston Skinner is correct in his showing that the British measures are related exactly to time and space.

I also propose to show that in forming one scale for measuring the Pyramid, the circle was divided into 360 inches and degrees, and that each degree is subtended by one inch of arc, and that the analytical unit of measure, viz.: 180 divided by π, or 3.14159+, equal to 57.295+, is one of the great keys for unlocking the secrets of the Great Pyramid. And that through this the British inch is made the theoretical unit for measuring the earth and the distance from it to the sun, moon and stars.

In this essay I beg the careful attention of all men, and assert that none, not even excepting the public school children who can add, subtract, multiply and divide, need fail to understand the purport and importance of what I propose to show.

I will take it for granted that I am speaking only to those who know the first rules of arithmetic, and are not acquainted with the terms of mathematics.

Therefore, to begin, I will state that the analytical unit of measure is the arc equal to radius, and is found by dividing 180 by π, and π is simply a term used to denote briefly the proportion of diameter to circumference of a circle, so that if the diameter was 1 inch the circumference would be 3.14159+, or 3 inches and an interminable fraction.

Now, this wonderful number is the angle of 57 plus degrees, the arc of 57 plus degrees or feet, inches or anything else, and the radius 57 plus inches, feet, yards or anything as a measure.

There is no question you will see by what I shall prove that the architect called the arc and the radius British inches; if so, you can see that each inch of the circle of 360 degrees subtends or is opposite to one degree at the centre.

Now, Mr. Skinner has shown that the downward passage from the mouth to the angle is 343.7745+ feet, and that this is diameter to a circumference of 1080, but this downward passage is exactly six times the analytical unit, that is, 57.29575+ multiplied by six equals 343.7745+ (call it feet) and twelve times 343.7746+ feet equals 4125.294+ inches, that is, there are 4125 plus inches in the downward passage. Now, is this the restored measure? and the question is a vital one.

Howard Vyse gives the downward passage to the angle at bottom 4126 British inches; this is remarkably close for so long a distance. One proof of the kind, of course, is not sufficient.

Let us return to the analytical unit; multiply it as degrees, by 60. It gives 3437.745, or three thousand four hundred and thirty-seven minutes and a fraction; and multiplying it again by 60 gives the number of seconds in the analytical unit, or 206264.7+ seconds.

This is a most remarkable number, and plays a most important part in the Pyramid

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measures, as shown by Mr. Skinner. It is given in 'Loomis' Astronomy', page 468, as a constant, and it is used for determining the distance to the sun as follows :

Distance to the sun equals 206264.7 divided by parallax of sun multiplied by (radius of earth.)

This being conceded, the analytical unit multiplied by 6 gave the number of feet in the downward passage, and that multiplied by twelve gave the number of inches, that is, 4125.294+.

Now multiply 360 by 360 and we have 1296000.

It will be found that this downward passage in inches is exactly equal to the diameter of a circumference of 12960.

Now, 4125.294 is exactly ten times the length of the king's chamber—or 412.5294+ B. inches. Piazzi Smyth measured it as 412.55 British inches.

This number is exactly the diameter to a circumference of 1296, and this is 36 in. multiplied by 36 in. or one square yard in inches, and 412.5294+ is 7.2 times the analytical unit of measure. Divide this by 2 and we have 206.2647+ the width of the King's chamber in British inches. Piazzi Smyth measured it 206.3 B. inches.

This is diameter to a circumference of 648, and it is 3.6 times the length of the analytical unit.

It is also ten nilometer cubits, as stated by Mr. Skinner.

It seems that one of the meanings of the solid diagonal may be nine times the analytical unit, or 515.66175+, this is diameter to 1620. The floor diagonal, as calculated by length and width, is 461.22 inches.

The end diagonal as measured by Piazzi Smyth is 309.4. This, if an exact measure of the analytical unit, 5.4 times is 309.39705+ inches, and is diameter to 972.

Now, the one-fourth of the king's chamber floor length is 103.132+inches.

This is evidently the restoration of the mind of the architect for the granite part of the ante-chamber floor, but it is rendered certain when we find by calculation that it is diameter to a circumference of 324, thus : 324 divided by Pi equals 103.13235. This granite is measured 103.13 inches. And we notice that 324 is one-fourth of the number of square inches in a square yard, and also is the sixteenth of the characteristic of the thirds in a day ; that is, there are 5184000 thirds in a solar day, and 324 is the 16th part of 5184.

The limestone part of the ante-chamber floor is measured as 13.24 in. by Piazzi Smyth. As the granite part is diameter to a circumference, it is reasonable that this should also be.

In the above I neither accept or reject the value of regular π, or Parker π, but use the latter—viz., 20612 divided by 6561. The propositions are true for any value of π.

This paper, I claim, proves that the British inch is, as stated by Mr. J. R. Skinner, the base of the Pyramid measures, and also that Professor Symth gave the exact theoretical base of the Pyramid as 9,140 on a certain base. Now, where is the Pyramid inch ? This Pyramid inch or sacred measure is by no means a myth, and will be the subject of a future demonstration.

Upon this paper I challenge the criticism of mathematicians and astronomers.

NOTE.—Do not fail to examine J. H. Dow's paper of June 7, 1882, in No. 1, vol. 1.

My concluding paragraph was a rather bold one—that I defied any astronomer to overthrow the accuracy of my conclusions. The main and principle one was that the Pyramid base was exactly 9,140 British inches long, and that the height was 5,818 plus inches, thus sustaining Prof. Piazzi Smyth; another statement made in that paper—that the king's chamber was

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askew—troubled me, and I was rapped over the knuckles by Cockburn Muir for making such a statement. This resulted from my using 229,183 inches for the height of king's chamber, and, although it may be inferentially believed that the distance is there, as Mr. Skinner insists, it was not borne out by the best measures for that calculation.

The base line I evolved from the interior was not accepted by Mr. Skinner, who was committed to 9,167.32 or $\frac{2400 \text{ ft.}}{\pi}$ or the measure of the French savants and Howard Vyse, and Davison, who give from 9165 to 9168 inches for base. The beauty, however, of the evolution of a base from the interior from the British measure and from the analytical unit measures, of which he himself was a discoverer, pleased Mr. Skinner. This evolution fixed my faith in his accuracy in relation to his theory as to the British inch, which has been strengthened by examination more and more.

My faith began to waver in relation to the 9,140, as I thought that I discovered an error of something more than the tenth of an inch. To many, and, indeed, the majority of mankind, this variation was nothing, but I had started out with the statement that unless my work could be proven to the millionth of an inch it should not be received or accepted. We yet stand by that statement.

I sent my whole paper to Mr. J. H. Dow to critically examine and after some time he returned it and said that no mathematician could overthrow my argument and conclusion. This was very gratifying, but not satisfying, since I knew the error was there, although I did not discover the formula. So I returned it again to him saying that there was an error of a little more than the tenth of an inch—too great. He soon came and said that he could reconcile the whole if I would change the height and base by a very small amount, a little over a tenth of an inch in base. I accepted it at once after examination, and have no reason to doubt but that $\frac{180^2}{2\sqrt{\pi}}$ represents the base named, 9139.871258 instead of 9140 and that $\frac{180\ A}{\sqrt{\pi}} = 5818.62287$ represents the height, and then Mr. Dow's formula for the exterior

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of the structure was brought into complete harmony with the interior, all relating exactly to the analytical unit, and to the British inch, and to the circle of 360° as shown by Mr. Skinner. And thus, by getting the corrected height and the corrected base, my paper upon the British inch may be considered as representing the Pyramid measures to the millionth of an inch.

And yet I am inclined to believe that the measure as put in formula by Mr. Skinner, namely $\frac{2,400 \text{ ft.}}{\pi} = 9,167.32$ inches is also indicated as one of the base measures, although the late measures of Mr. Petrie may not show it, but do show overwhelmingly the 9139.871258 or $\frac{180^2}{2\sqrt{\pi}}$. on level of S. E. socket. But how it is possible that the French savants, the measures of Col. Howard Vyse and others, could have been in error to the amount of over three feet is beyond comprehension and calls for a careful re-measurement undur the authority of the Society, for the question is vital. But, as I shall show, we are not left in doubt as to the ratio or relation of our measure "the British inch" to the circle of 360° even if the measure 9139.871258 could only be inferred from a greater base and a greater height.

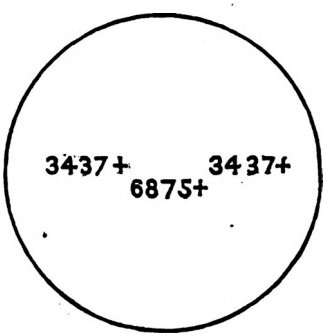
As I said before, the papers of Mr. H. G. Wood upon the British mile turned my attention to a new solution of the Pyramid inch question. It will be remembered that he advanced the theory that the British mile of 5280 feet agreed, or was likely to be found agreeing, with a minute of arc in the latitude of the Great Pyramid or 29° 58′ 51″, or say 30° and the whole matter hinges upon the shape of the earth.

Dr. Seth Pancoast wrote me some time ago "You and Mr. Skinner should go for the coffer."

If the earth be an ellipsoid, then the measure of a mile, 5280 feet on the earth, according to Prof. John N. Stockwell, would be equal to one minute of arc at a point about five miles south of the Great Pyramid; but astronomers are at sea as to the shape of the earth, hence it may well be that Mr. Wood is correct in his thought that the architect of the Great Pyramid placed the structure at a point where, if you measure east and west, you would find that 60 minutes or 1 degree of heavenly arc would

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subtend 60x5280 feet on the earth; this is yet to be proven. The arguments from the coffer and the Pyramid are much in favor of the correctness of Mr. Wood's theory. If true, it will be a wonderful and beautiful thing. Let us see how the coffer measures bear out this theory. Mr. Skinner has taken 90 inches for the length, 41.25 inches for the height, 34.37 inches for the depth, 78 inches for the inside length, 27 inches for the inside width. With these measures he obtained the thickness of sides, 6 inches, thickness of bottom, 6.875 or $\frac{21.6}{\pi}$ or one tenth of twice the depth of the coffer. The exterior cube exactly half the exterior to the remotest fraction. This is doubtless one of the solutions of the curious problem of the doubling of the cube. Now it will be observed that the height is one tenth of the king's chamber length in inches, and the depth is the tenth of the downward passage in inches for feet, and the bottom is one tenth in thickness of depth of coffer multiplied by two; that $34.377 \times 2 \div 10 = 6.875+$ and Mr. Skinner shows that this last number is diameter to a circle of 21.6. Now let us put these measures of the coffer upon a circle:



$360° \times 60' = 21600$ minutes or miles.

According to Mr. Wood the Pyramid is placed in such a position on the earth that the circumference of the earth on the parallel of latitude of 29° 58′ 51″ equals 21600 English miles or $21600 \times 5280 = 11404800$ feet, or that 1′ of arc subtends 5280 feet, or that the proportion is one minute to a mile. Now we

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see that if we take 100 times the depth of the coffer for a radius, taking miles for inches, we have the radius of the earth in the latitude of the Pyramid and the thickness of the bottom of the coffer is just one thousandth of the diameter of the earth in latitude 29° 58′ 51″, taking miles for inches, or 6875+ miles. This is the diameter of the section of the earth in the latitude of the Great Pyramid.

Now this radius 34.377 is also the distance from the north end of grand gallery to the centre of the well, and the king's chamber length 34.377 in feet is the same on the depth of the coffer in inches, and one-hundredth of the radius of the section above mentioned taking miles for feet, and the width of the grand gallery above the ramp is 68.75 inches or ten times the bottom of coffer, and one-hundredth of the diameter of same section of earth through 29° 58′ 51″, miles for inches. Now suppose that Mr. Wood is not exactly correct and that the Pyramid is placed from 5 to 8 miles north of that circle of latitude which gives the above proportions. Do not the measures of the coffer, the king's chamber, the ante-chamber, the width of the grand gallery, the distance from the beginning of grand gallery to centre of well all agree with the measure of the circle and diameter of the earth in British miles? When 5280 feet is subtended by one minute of heavenly arc, and which Prof. Stockwell says is, counting the earth as an ellipsoid figure, correct for the circle of about 5 miles south of the Pyramid.

To recapitulate: You take the length of the coffer, 90 inches, square it = 8100, divide it by half the square root of π, or .886,226,925, you have the base of the Pyramid 9139.871258+ British inches. Divide the base by half the square root of π and we have 100 times the length of the granite of ante-chamber floor or 10313.4 British inches. Now divide this last number by half the square root of π and we have twice the height of the Pyramid or 11637+ British inches, or one hundred times the length of the ante-chamber floor, limestone and granite.

Now all of these circumstances prove conclusively the relation of the British inch to the circle of 360°, and the measures of the earth in latitude 30° or within gun shot of it (we think it will be found exactly in latitude of Pyramid), and that these meas-

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ures agree with the British mile and the common cubit of Israel, and overwhelmingly coincide with the measures of the interior and exterior of the Great Pyramid.* We ask all to examine and study these premises. Now what remains, since the relations of the British measures are to the latitude of 30° and 360° and space, what relations have these to polar diameter? Certainly there is an exact relation; what is it? We know that in getting the distance to the sun astronomers use 206265, or the number of seconds in the analytical unit and one thousand times the width of the king's chamber, seconds for inches. Mr. Petrie has shown that the distance from the S. E. to the N. E. socket is 9131.055 inches *British*. Divide this by 25 and we have 365.2422 or the number of days in a year. Now the relation between the diameter through the section of the earth in latitude 29° 58′ 51″ is shown by dividing $\frac{9131055}{91399871}=\frac{1}{999}$.

The British inch has a positive relation to the earth as originally intended connected with 360°.

CHARLES LATIMER.

THE PERIMETER OF THE SIDE WALLS OF KING'S CHAMBER.

The π formulæ for king's chamber, given in Vol. 1, No. 1, of Magazine, bring out a wonderful confirmation of Mr. James Simpson's "2d height" of the walls (their height from the bottom of the lower course, which is about five inches below the floor level). It is as simple as A B C, and yet I have been two years searching for it.

Here it is: Let l=length of king's chamber, *i. e.*, $\frac{1296}{\pi}$, let b=breadth, *i.e.*, $\frac{648}{\pi}$, and let h=2d height. Then, by Simpson's rule, $l+h=\pi\ b$. Multiply both members of this equation by 2, $2\ l+2\ h=2\ \pi\ b$. Substitute the π value of b, and we have $2\ l+2\ h=2\pi\ (\frac{648}{\pi})=1296$. But twice the length plus twice the height is the circuit of the wall, hence:

* See Mr. Wood's papers in former numbers of the Magazine.

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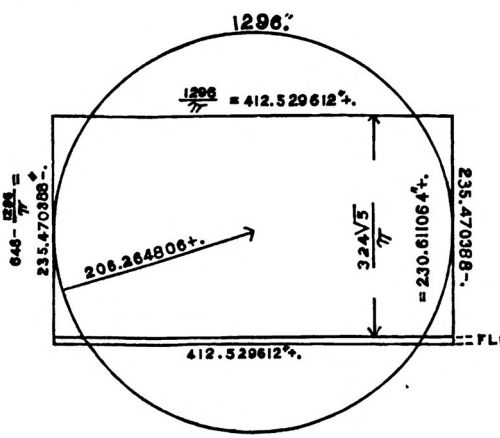
1st. The circuit of each side wall of the king's chamber measures exactly 1296 British inches, and, as Prof. Smyth states in 'Our Inheritance,' the length of the wall is diametral to the circuit.

2d. The circuit of the side wall represents, on a scale of $\frac{1}{1000}$, a circle whose circumference measures one British inch for each second of arc, and whose radius is exactly 10,000 cubits (20.626.48+inches); showing thus the correlation and common origin of the inch and this primitive secular cubit.

3d. The circle of 1,296,000 inches in circumference indicated in the king's chamber suggests the probability that the double accent mark (″) which we now use to express both inches and seconds of arc, may have been used for both purposes 4,000 year ago. If so, the hieroglyphics over the ancient entrance to the Pyramid, which were interpreted to Herodotus to denote onions, radishes and garlic, may really have been our identical degree (°), minute (′) and second (″) symbols, as some writer has already intimated.

The 2d height is obtained numerically by simple subtraction, 648—412.529612+=235.470388—.

It may be of special interest also, that π times the diagonal of side wall is 1492+.



LONGITUDINAL SECTION OF KING'S CHAMBER.
Scale $\frac{1}{200}$.

412.529612
235.470388
412.529612
235.470388
1296.000000

I wish to add here, with emphasis, that the British inch, however firmly it may be established, will not necessarily crowd

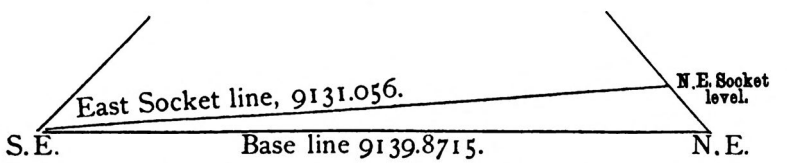
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out the Pyramid inch. I am beginning to think that the British inch is intended mainly as a legitimate secular measure, but the Pyramid inch is the unit of sacred measure, and that the two units are related in the ratio of 9131.055 to 9139.871258.

When we shall have arrived at the full interpretation of the Great Pyramid, I am convinced that Prof. Piazzi Smyth will have less to retract from earlier theories than any other Pyramid student. J. H. Dow.

PROFESSOR SMYTH'S PYRAMID INCH.

According to Mr. Dow's theory, the geometrical base line of the Pyramid at the level of the S. E. socket is 9139.871258 British inches. Taking Mr. Petrie's measure, 11.4 for the difference of level between the S.E. and N.E. sockets, the east socket line, according to the π theory of slope, would be 9130.89 inches and 365.2367 for the astronomical year. But if we take 11.22 as the original difference of levels, we shall have 9131.056 for the length of the east socket line, which would give 365.2422 for the astronomical year, in accord with the π theory and Mr. Dow's base line of 9139.871258.



I suppose it will not be doubted among Pyramid students that the east socket line, 9131.056 British inches, is a measure of the astronomical year. Now, if we would find a measure of that year in the true geometrical base line of the Pyramid, the unit of measure must be somewhat longer than the British inch, which measures the east socket line 9131.056. How much longer may be found by dividing 9139.871258 by 9131.056? The quotient is 1.000965. Therefore, the geometrical base line 9139.871258 represents the astronomical year just as correctly, if we use 1.000965 British inches for the unit measure, as it is represented

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by the east socket line in British inches. We may call this slightly lengthened unit of measure a Pyramid inch if we please. Professor Smyth's Pyramid inch is 1.001 British inches. The difference between this and a Pyramid inch obtained from Mr. Dow's base inch is 1.001 – 1.000965=.000035 or 1-30000 part of an inch. We may truly say that Professor Smyth's Pyramid inch, 1.001, is the astronomical year unit of measure on the *base line*, and Mr. Dow's British inch is the astronomical year unit on the east *socket line*. Strictly speaking, the Pyramid inch of the base line is 1.000965 British inches, but for practical purposes of building it might be taken as 1.001, as the error, 1-30000 arising from the unit of measure could not be detected by instruments.

H. G. Wood.

SUGGESTIVE NOTES ON PYRAMID MEASURES OF MR. PETRIE AND OTHERS, FROM LETTERS OF J. R. SKINNER TO MR. LATIMER.

FROM LETTER I.

From the exceedingly important and grave aspect which the Pyramid studies are taking with me, I feel impressed to write again upon the subject. You know how very careful I have always been in my investigations, so much so that I have never suffered a haphazard or catch idea, however fascinating, to go forth, but have confined myself strictly to ascertained reliable measures and angles, to obtain their solution in architectural design, if possible. "Catch your rabbit first and then cook it." Show the exact measures first and then test their probable application. The sun's distance is really a disputed quantity by some 500,000 miles, among the greatest authorities; the earth's diameters by some 500 or 600 feet, say 1,000; the elements of the precession of the equinoxes are not as yet determined. By some the earth's shape is a variable, and by some the time of the lunar periods and the earth's yearly passage is a fluctuating measure. Therefore every one can find a support for this or that calculation, and is tempted to warp a real structure, as is the Pyramid, to suit a value or series of values,

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as yet indeterminate, so as to make them fixed as standards. The result is confusion worse confounded. To a certain extent I believe we are agreed on certain definite standard data:

1. The British inch.

2. The N. cubit value taken from radius seconds of the circle of 360°.

3. The use on the Pyramid of these in a system of diameter measures exhibiting or indicating circumference values.

Your acceptance of a series of these measures has been in finding them applying in so many coherent and interrelated ways as to prove, say, incontestably their existence. These measures, so accepted by you, have been found in the upper and interior parts of the Pyramid. The lower part, that is especially the descending passage way, you have purposely avoided committing yourself upon, though in full harmony, correlation and coherence with the upper works, because of the uncertainty *of the length of the base side*, a matter still in question by a comparatively large measure of some 30 inches or 2½ feet, a confounding discrepancy for an exact work. I assent to this as the right course for you and the Society. But for myself it has been otherwise. All the upper measures had to grow out of this lower one of the descending passage. They developed *out of* its *location* and measures, on the π modulus, so that all formed one harmonious whole and many details in a just and interrelated symmetry. Moreover this descending passage was found to point to a most singular relation with respect to the *ground level*, or base of casing stone; for the foot of the passage was found to be 100 British feet or 1,200 inches in vertical depth below that level, which indicates a circumference to a diameter of $381.9\overline{71}\pm$ inches, while the half distance between sockets in length shows to be $381.9\overline{71}\pm$ feet, or a diameter to a circumference of 1,200 feet. The exceeding harmony of these data, taken as they were *to conform to actual reported measures*, having the highest praise of those whom we esteem authority (among them especially Piazzi Smyth) has been sufficient to make me morally certain that they would finally grow into the approval of the Society.

I have not seen not read Mr. Petrie's book, for I have been

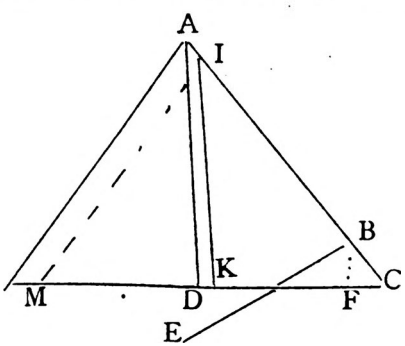
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till within a short time exclusively occupied with my Hebrew Bible reading. But I have become greatly interested in some of his measures, as noticed by Mr. Beswick, and which I have already referred to in my last to you. As to the descending passage way: If you will refer to page 132 of 'Source of Measures,' you will see how I made use of Vyse's and Smyth's measures down this passage to find a coinciding objective point with them. Smyth commenced at the edge of *basement sheet*, and measured down 162.3 inches, which length referred to the roof gave Vyse's starting point. Smyth measured down from A′ to C′, a distance of 981.9 inches to the junction of the roof line of the ascending passage, and he made the distance back from C′ to O, or the edge of the break-out 60.0 to 60.3 inches, say 60.2. Then from B, Vyse's starting point, to O is 981.9—162.3=819.6 and 819.9—60.2=759.4 inches. Vyse gives for his measure down to this break-out 758 inches. I took it, therefore, that the edge of this break-out characterized these two measures, viz., of 759.4 and 758, of these two, the chiefest, measurers in and about this structure. The difference I took to be explainable by the ragged edge either of the break-out or the basement sheet. With this foundation and the vertical height of basement sheet above the ground level of 49 feet by Vyse ('Source of Measures,' page 116, foot of page) and Smyth's angles, I made use of Vyse's continued measures, and his restoration of the dilapidated casing to see to what extent either the Turin or the Nilometer cubit measure from the *modulus* would apply. Vyse gave the total as "about 4126 inches." I made it 2062.647×2=4125.294 inches, or just 200 Nilometer cubits, or ten times the length of the king's chamber, but in time measure it was twice the *radius seconds* of the circle of 360°. In feet as 343.7745 it was diameter to a circumference of 1080 feet, while as 3437.745 minutes it was radius minutes of the same circle, and also 34.37745 inches was the inside depth of the coffer. Also, if you add to 343.-7745 its 1-9th, or 38.1971, you will have 381.971+ feet, which I still hold to be the measure in length between the sockets, of N. base side, on the authority of the French, of Vyse, of the Sultan and of Piazzi Smyth. I am thus particular for this reason:

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It is now placed beyond question that the angles of the sloping side and of the descending passage way are to all intents identically the same with all measurers, as nearly as any two competent men can give them as the mean of his best efforts. That which is desirable is to determine the angle architecturally made use of; and this can be had from a knowledge of the plan from which the architect wrought. John Taylor, we are satisfied, recovered this as to the elements of the shape of the mass. The location of this passage way with its length of 4125.290 inches, so as to give the bottom of the passage a vertical depth of 100 feet or 1200 inches below the base of casing stone, and a vertical height above this base for the outer and lower lip of the descending passage of thirty-one T. cubits or 638.97+ inches, restores the angle as 26° 28′ 24.10″ which is in contrast with one of Smyth's as 26° 28′ 17″, I believe. Now Mr. Beswick quotes Mr. Petrie as fixing this vertical height above the ground level, of the outer and lower lip of the descending passage as 638.4. I think he mistakes as to Mr. Smyth, for I think Mr. Smyth never has made an estimate of this height, at any rate to my knowledge.

Thus, then, if we have given to all intents a sameness, (1) as to the angle of the sloping side, (2) as to the angle of the descending passage way, and (3) the vertical height of its outer and lower lip above the ground level, with the wonderful measure applying to Col. Vyse's recovery of the length of "about 4126 inches," viz.: 200 N. cubits of 4125.294 inches, then we can say that we fasten the construction as follows:



angle ACD fixed; angle EBC fixed; location of EB as

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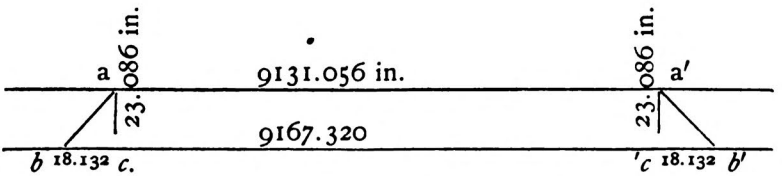
to angle, and intersection of AC in B, fixed. But on this location of EB all the upper interior works *are shown to be in essential location* constructed. *Therefore*, all this work as I have shown it in the Crown Jewels, can be and must be taken as the conception of the architect by his measures, *no matter what may be the measure of the base side.* For, if you determine that base side to be 9131+ inches long, and desire to show this from the above plan, you would accomplish this in effect by shifting the vertical axial line AD to IK, making your vertical section of the entire Pyramid CIM with the base desired, *leaving all the interior work exact and in position* with the exterior slope line.

I have tried to be plain, and think you will see the truth of what I have advanced if you will but give the matter a little thought.

You know I have always thought that Mr. Smyth's 9131+ measure is in the Pyramid, but not as he takes it, viz.: as the mass of the symbol itself, which would symply indicate *sun worship.* I showed you and wrote him how this is shown, and in a much more perfect way than he or any one has shown, of those who are so twisting and racking Mr. Petrie's measures to squeeze even an approximate neighborhood to the value of 365.2422.

The heights of the ramp of the grand gallery are given by Mr. Smyth as a *mean* of 23 inches, on which you can take the measure of 23.086+ inches. The ramp, by my plan, abuts against *the vertical axial line of the Pyramid.* Then a little pyramid with this height will have a base of $18.132 \times 2 = 36.264$ inches. Refer this down to the base, as if you would slide it down there, and it will cut out this from the length of the base side, cutting through the foot of the axial line. Now I say the base (of the north side) is 9167.320 inches long. From 9167.320 take 36.264 and there remains 9131.056 inches, four times which is 36524.224, showing 365.24224 or the tropical year value. Now suppose this same thing was shown by the *pavement covering a portion of the foot* of the base:

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a and *a'* are the points of contact of pavement with sloping side. The bases *bc* and *b'c'* equal each, 18.132, or together 36.264. Then the base line of the Pyramid indicated by the top of the pavement would be 9131.056 in. I took the thickness of this pavement as one T cubit, because Vyse gives it as about twenty-one inches. Still it might at *some other point* or in some other way show a depth of 23.086. *I only give it to show a possibility.**

This whole matter has become with me of greater importance than ever, because I find this Pyramid and its measures to be *the burden of the Hebrew Scriptures from the beginning of Genesis through the books of Moses and the entire Bible in fact.* This I can show beyond question and have it down as a reading of Scriptures. This reading is as perfect and coherent in its way as Crown Jewels is in its.

The symbol running through the whole is this great Egyptian Pyramid. This is the reason why I hope you may be led to look more closely than ever into the merits of the construction of the Pyramid by the *modulus measures,* for the matter gets all its superlative importance, in the way of Biblical exigesis, from this modulus.

I am indeed glad and thankful that the measures under the modulus are obtaining such strong recognition, as *ex. gr.* Bes-

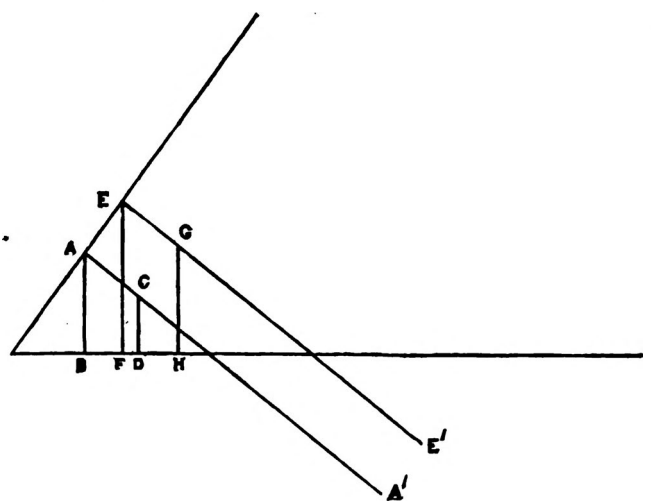
*NOTE.—Examination of Mr. Petrie's work brings out a novel idea as to this matter. We have been led by Mr. Smyth into the error of including *the thickness of the pavement* in the mass of the Pyramid. To the contrary, the Pyramid is constructed *on the surface of the pavement* (see 'Great Pyramid' by John Taylor, p. 13), which Mr. Petrie gives as from 22 to 27 inches in thickness: In his levelling for height of edge of basement sheet, it would seem that he started from *base of pavement* and not from its surface, making the height 611.2 inches. Vyse measured from *surface of pavement,* or base of casing stone, making the height 588 inches. The difference would be the thickness of pavement or 23.2 inches. The thickness of 23.085 inches would reconcile all conflicting claims, making the base proper of Pyramid on surface of pavement 9131.$\frac{056}{}$ inches long, while an ideal projection of the slope line through the pavement that depth would give, between socket corners, the distance of 9167.$\frac{320}{}$, as per Vyse and others.

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wick on page 48 of the Magazine. Mr. Smyth himself seems to be yielding, and Bexendell now works in terms of British inches. I tell you there lies the basis of a revolution of thought in this matter.

FROM LETTER II.

Mr. Petrie has had to accommodate the interior to his exterior structure, and has run the vertical axial line of the Pyramid down through the apex of the queen's chamber.



AA′ and EE′ represent *about same* length of floor line of descending passage-way by Vyse and Petrie, 4126 and 4143, with nearly the same angle. The upper edge of basement sheet is *common* to both, and is represented by C for Vyse and G for Petrie; AC by Vyse is, say, 113.8 inches; EG by Petrie is 124.2 inches; AB by Vyse is 638.9; EF by Petrie is 668.3+21 =6893. Now CD the vertical height of edge of basement sheet, is 49 feet above ground level (21 inches under face of pavement). GH, *the same line* as CD, is by Petrie 611.2 inches *above surface* of pavement, or compared with Vyse's measure GH is 611.2+21=632.2 inches in vertical height. Or, relatively, the point C by Vyse is removed by Petrie to G, at a verticle height over C of 632.2—588=44.^{2} inches *or nearly* 4 *feet.*

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The masonry courses are changed so that whereas by Vyse *c* is in the lower edge of the 16th course (your chart counting the lower course as 2 in 1), G, the same point, is two courses higher up by Petrie.

Now the pavement before the basement sheet was laid bare by Vyse, the thickness of the pavement was before him, and all plain levelling work to obtain the vertical height of the point c, which he gives as 49 feet, or 588 inches.

Can it be that Vyse and Smyth have blundered so monstrously as this? 44½ inches or nearly 4 feet in this small altitude?*

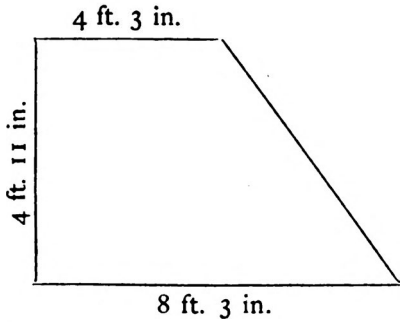
I have examined Mr. Petrie's measures with care. As to the interior they serve practically to verify those of Col. Vyse and Professor Smyth, but as to the exterior they are manifestly worthless, and by his own showing make the length of the base side *longer* than do either the French or Vyse.

The data to show this are as follows:

He gives us the professed exact dimensions of the *core masonry* or base sides of the existing dilapidated mass. These were also given by Davison, by the French and by Vyse. As to the latter, Mr. Davison gave the measure of the present north base side as 746 feet, the French "having measured the apparent base of the Great Pyramid twice, viz., from east to west and from west to east, with a good measuring chain, receding for that purpose one hundred feet towards the north, but still keeping on a line parallel with the base, M. Jourard found the length of the Pyramid from one visible angle to the other to be 745.8 English feet," and Col. Vyse measuring the same, found it to be 746 feet, or as he calls it, "the present base." This is the north side of the "core masonry" of Petrie, and is 8952 inches. Col. Vyse found a casing stone *in situ* set up to this core, on the north side with the following dimensions as given, viz:

*NOTE.—Explained and conflicting measures reconciled in preceding note.

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Thickness at bottom 99 inches, at top 51 inches, height 59 inches. Mr. Petrie follows Vyse as to general description, and gives the dimension as, thickness at bottom 108±8 inches; at top 62±8 inches; height 58.85 inches; and we may take these respectively, as net, 100, 54 and 58.85, which practically give Col. Vyse's measures.

We now want the "core masonry" of Mr. Petrie, that is, what are we to understand by the term? On examination we find that he intends by this term "the present base" of Col. Vyse, the French and Mr. Davison. He says: "The form of *the present* rough core masonry of the Pyramid is capable of being very closely estimated." Then giving his means, he states his results as follows: "Case plane sides, N., 9002.3; E., 8999.4; S., 9001.7; W., 9002.5; inches. Socket sides, N., 9129.8; E., 9130.8; S., 9123.9; and W., 9119.2 inches." He gives a mean of arriving at the same result in another way, and by a more detailed method, shown in "Plate X," where for "the core plane on pavement" for the N. side, he gives: N. side of Pyramid base, on the level of the surface of the pavement, 9069.4 inches. Deduct from this 29.4 inches on the E. side, and 27.7 inches on W. side, or together 57.1 inches and there remains for length of present rough core plane 9012.3 inches. It is true this differs from the above same measure by 10 inches, but it is nevertheless Mr. Petrie's arrival to practically, by him, the same measure of the same length, by another co-ordinating process. To show this, he gives E. side as 9067.7 inches, with 22.4+23.1=55.5 inches to be deducted, leaving 9012.2 inches; S. side 9069.5 inches with 35.5+32.3=67.8 inches to be deducted, leaving

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9001.7 inches for core side length, which in this instance agrees with the result of the same measure as above given. The W. side he gives as 9068.6 inches, with 36.1 to be deducted, leaving 9032.6 inches for core side. Thus, there is no mistake as to the meaning of the term "core masonry" and the measure given of it. It is the *present existing* base, identical with that measured by Col. Vyse. It is "the present rough core masonry" of Mr. Petrie.

Now being such, and the north side being 9002.3, or 9012.3 inches, then this exceeds the measures of the same length by Col. Vyse, viz: 8952 inches, by 52.3, or 62.3 *inches.* But if we add the thickness of the casing stone, or 100 inches, twice to this, we will have as the restored length of N. base side 9202.3, or 9212.3 inches, or 766+, or 767+feet, as the proper result of Mr. Petrie's measures.

It is well enough to quote from his work as to the mode of obtaining one of the above groups of results. He says: "The form of the present rough core masonry of the Pyramid is capable of being very closely estimated. By looking across a face of the Pyramid, either up an edge, across the middle of the face, or even along near the base, the mean optical plane which would touch the most prominent points of all the stones may be found with an average variation at different times of only 1.0 inch. I therefore carefully fixed by nine observations at each corner of each face, where the mean plane of each face would fall on the socket floors. On reducing these observations to give the mean form of the core planes at the pavement level, it came out thus: Case plane sides, (given above); socket sides, N., 9129.8; E., 9130.8; S., 9123.8; and W., 9119.2 inches."

If one reflects a moment, he will see that this line so sighted, passes over the *present* "prominent" edges of the core masonry, and being projected to the socket faces or floors, gives, as by Mr. Petrie, a length of this line for the N. side of 9129.8 inches. Now this is the line of the entire width, or length of the restored Pyramid by Mr. Petrie, being some 30 inches *within* the lines joining the sockets, reducing the measures from 9159.8, say, to this 9129.8 inches.

So far this is all very plain work, but for exactitude it involves

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a remarkable and strange omission, which it is almost incredible that Mr. Petrie should have made. It is this: On referring to the diagram above of the casing stone, it is seen to have a flat top of some 51 inches in depth or thickness horizontally. Now *after the first* course of masonry the casing stone of each succeeding course would be brought out to overlap this 51 inches, *but as to the first course* itself, the core masonry of the Pyramid *would be increased* on each side by this 51 inches, and the points over which Mr. Petrie sighted were 51 inches inside of the true position for the plane which he sought. This is true, I think, and seems to be the inevitable conclusion to which one is driven on the examination of Mr. Petrie's descriptions.

Now let us analyze the measure of the core masonry side by Mr. Petrie, as compared with the measure of Howard Vyse. The latter gives it as 8952 inches, and to this is to be added the 51 inches of top of casing stone, and then the excess of 99 inches, the bottom of the casing stone, over 51 inches, or 48 inches to complete the extension of the restored base for each side; that is, 51 taken twice, and 48 taken twice. Suppose Mr. Petrie saw the necessity also, but instead of adding $51 \times 2 = 102$ inches for the *extended* core masonry, which he really had in contemplation, he, by mistake of omission, only added it *once* to Col. Vyse's measure, making $8952 + 51 = 9003$ inches, which is Mr. Petrie's actually given measure. Here we see the measure which Mr. Petrie really gives, and at once have the key to his confusion. He really was confirming the measures of the existing present base, or core masonry, as by Vyse and others; and then, in his attempt to make the core masonry measures by the flat top of the casing stone, he *omitted to add it twice* for the casing stone on each of two sides. So he increased Vyse's measure 8952 inches by 51 inches, giving his result of the length of the core masonry on the N. side, viz., 9003 inches, whereas he should have added just double this, giving the restored core as 9054 inches. With this new and correct idea of the extension of the core masonry by the depths of the flat tops of the casing stones, his sight lines or planes projected down on to the socket floors would simply have restored Col. Vyse's measure, or 9168 inches; that is, it would result in add-

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ing to the core masonry, on each side, the excess of the length of the bottom of the casing stone over that of its top, or of 99+ inches over 51 inches.

This is the main blunder made by Mr. Petrie, but it is fatal to his work, both as to length of base side, as also to his carefully elaborated closing of the mouth of the descending passage way in the thickness of the 19th course of masonry. Indeed, as said, it renders Mr. Petrie's work as to the exterior of the Pyramid worthless.* J. RALSTON SKINNER.

THE STRUCTURE OF THE BASE.

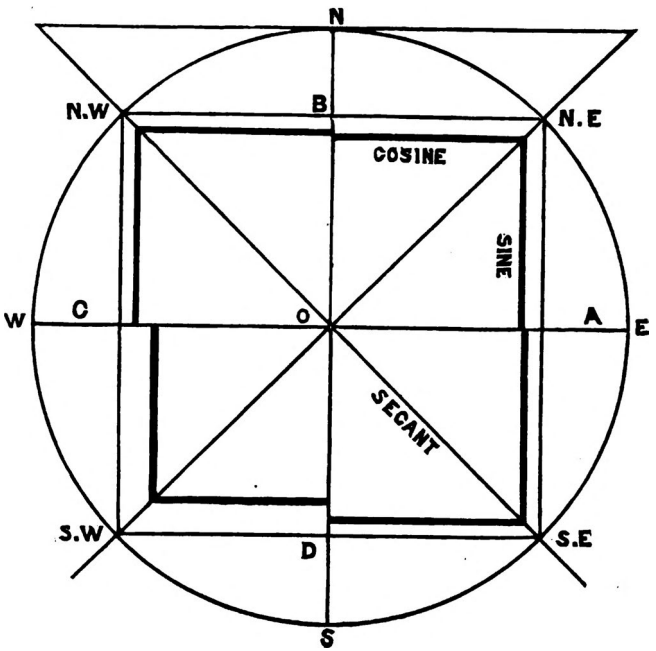
Perhaps the most interesting portion of our review of Mr. Petrie's book will be found in the present culminating article. Having considered the general structure of the base, and the probability and certainty that the architect plotted it and laid it out theoretically on the solid rock, as a sort of trial square, where he proposed to erect his pyramid, we may now consider what that general plan would be, which would form a working plan for the builders themselves, and yet embody all the leading features of the future edifice.

What was that general working plan plotted on the spot where the great Pyramid was to be built? It was neither more nor less than a trigonometrical arrangement of sines, cosines, tangents and cotangents, such as is always used in our common

*NOTE.—On working out Mr. Petrie's measures of the descending passage, and to the intersection of the ascending passage, his own data show *a necessary shortage* of 18 inches on 4143, by which he makes the passage length 4125 inches, which is the same with Vyse. This effectually breaks up his theory as to the 19th course of masonry. This being the fact, both have the same measures and the same angle for this passage. To this is to be added the mode of reconciling the "height of basement sheet," as 588 by Vyse and 611 by Petrie, as shown in preceding note. Then follows the correction of the error of Smyth, viz.: that the Pyramid proper was built *on the surface* of the pavement. By this the "between sockets" of Vyse, being 9168 inches, marked the limitation of the pavement, *on which*, and 18.132 inches inside the socket line, the Pyramid proper was erected with a base line of 9131.086 inches. This would serve to reconcile all conflicting claims of measures, and give a basis for a satisfactory solution of the conflicting statements as to core masonry and casing stones.

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text books on trigonometry, and which was probably used by the geometers of the ancient schools when the Pyramid was built, as is exemplified in Euclid's 'Geometry.'



We have embodied this working plan in the above diagram, which every geometrician will recognize at once as a trigonometrical plan of sines, cosines, etc., known as the trigonometrical circle, which is divided into four equal parts by two diameters, perpendicular to each other, and each part is a quadrant. Now the trigonometrical square within the circle is an exact representation of the actual Pyramid base, as deduced from the measurement of Vyse, Ordnance Survey, French Survey, Smyth and Petrie. The latter gives a diagram, Plate X, identical in all its main features with the one here given. Our diagram is in fact, a rough sketch of the working *plan* of *the builder* of the *great* Pyramid, showing, very exclusively, *that the architect* designer or builder used such a system of arcs, sines and cosines in the erection of his building.

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Of course, the proof would have to conform to all the requirements of his working plan. And it does conform and agree in every respect. The main feature would be that the core masonry would run out its sides at right angles, forming a system of sines and cosines; each quadrant having its own distinct system. And in such a case the S. E. quadrant would be the initial one. In this case all the quadrants have different sines and cosines, and the core masonry would have four irregular angular points in the middle of each face of the Pyramid, at A, B, C, D. Each face of the core masonry would have a sunken joint in the middle, or hollow at that point of junction. And as the finished faces would be perfectly level, smooth, and having no irregularity or unevenness on the surface like the core masonry, the casing stones on each face would be thicker at its joint on one half of its four faces, and thinner on the other half. On the other hand, if the four sides of the core masonry had been formed of sines equal to the cosines, then the sides would have been equal and form a perfect square, with casing stones of equal thickness all round.

But in the case of the Great Pyramid, the casing stones would begin to be suddenly thick and thin at these middle points at A, B, C, D. In other words the N. E. quadrant would have a thicker casing than the S. E. and N. W. quadrants, and the S. W. casing would be thicker than the S. E. and N. W. quadrants. The thicker casing would belong to the N. E. and S. W. quadrants, and the thickest casing of all would be in the S. W. quadrant. To a person not understanding this structure, the core masonry would have the appearance of being hollowed out at the middle of each face, with thicker casing stones at the middle to fill up the alignment of the face with the corners and angles of the Pyramid.

Now this is actually the case with the great Pyramid. Mr. Petrie detected this fact without knowing its cause, or detecting its significance. The following is what he says, p. 43:

"At the corners, however, the casing was thinned, averaging but 33.7 (difference of core plane and casing on pavement), and this is explained by the faces of the core masonry being very distinctly *hollowed*. This hollowing is a striking feature; and

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besides the general curve of the face, each side has a *groove specially down the middle of the face*, showing that there must have been a *sudden increase* of the casing *thickness down the middle.* "The object of such an extra thickness down the middle might be to put a specially fine line of casing carefully adjusted to the required angle on each side, and then afterwards setting all the remainder by reference to that line and the base."

This is a demonstration of our discovery of the true form and significance of the Pyramid base. But it is evident that Mr. Petrie could not understand it, and did not detect the true cause and significance of the hollowing and grooving of the core masonry, and the sudden thickness of the casing at the middle of each face.

From the base we may now go to the general structure of the Pyramid. If this form of base be admitted, the trigonometrical centre of the sines and cosines would be the vertex of the circle, and the radius would be the origin of angles whose vertices meet at the centre of the figure. This brings us to the conviction, that the vertical axis is in the centre of the general figure, otherwise the sines and cosines of the sides would be untrue and unreliable. The whole Pyramid, through all its courses, will bear the same relation to the vertical axis and sides, because every course will practically consist of the same combination of sines and cosines, with the groove in the middle of each side.

A careful inspection of the top of the Pyramid by Mr. Petrie has demonstrated this theory of the upper courses, as clearly as with the lower and lowest courses near the base. Mr. Peytrie says: "The top is, rather strangely, not square." And the casing here also must have been thicker on the S. W. and N. E. quadrants than on the S. E. and N. W. quadrants. But Mr. Petrie did not discover the cause of this singular arrangement.

By way of illustrating this trigonometrical plan of the Great Pyramid base, and for the special purpose of giving it the most obvious demonstration beyond the reach of suspicion or doubt, we will take Mr. Petrie's own figures as data. He says the axis of the Pyramid trends 5′ 16″ from the true north, p. 38, and on page 41 he refers to his own dia-

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gram, Plate X, which is almost identical with the one we have given above, in the following words: "The main skew of the core to the base is 1′ 33″, and its mean azimuth—5′ 16″ to true North." With this deviation the sine of the N. E. quadrant will be lessened by that amount, and the cosine also, and the break in the line must of necessity be made at B in the middle of the base-side, where the N. E. cosine ends and the sine vanishes. The break could not happen anywhere else, the hollowing groove could not be made anywhere else, if the base is constructed according to trigonometrical principles. The line might have been a straight diagonal line without any break or hollowing groove anywhere. But the hollowing groove and sudden angle in the very middle of the line, where the cosine touches the northern axis, proves beyond all doubt or cavil that the *two halves* of the north side of the Great Pyramid have been constructed and planned to represent the cosines of a trigonometrical square, which has been divided into four quadrants. And as the cosine is diminished by a trend of 5′ 16″ west of north, the length of the N. E. side will be equal to the value of the cosine in the N. E. quadrant, and will there end exactly in the middle of the north side of the Pyramid.

Let us now test this theory with Mr. Petrie's data. The N. E. socket and corner is 11.4 inches higher than the S. E., with a trend of 5′ 16″ to the west. This would give a line of $\frac{9130.8}{2}$=4565.4 inches for the eastern half of the north side. The western half, with a socket at the N. W.=7.1 inches high would be $\frac{9128.8}{2}$=4564.4 inches, making a total length of

Eastern half, 4565.4 cosine.
Western half, 4564.4 cosine.
9129.8

This is exactly the length of the north side given by Mr. Petrie.

So with the S. E. and S. W. halves of the south side of the base. Mr. Petrie says the axis trends 4′ 58″, which will lessen the sine and cosine of the S. W. quadrant to that extent. The S. W. half of the side, with a socket 16.9 high, will be $\frac{9118.9}{2}$

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$=4559.45$ inches in length, and the S. E. half will be $\frac{9128.9}{2}$ $=4564.45$ inches in length, making the total length of the south side 9123.9 inches. This is the length given by Mr. Petrie.

Now comes a *test question.* On the supposition that these two sides, north and south, are actual straight lines, as Mr. Petrie supposes in his calculation of the sides, how is it possible for the length to agree with the hollowing grooved character of the middle of the core masonry, except upon the supposition that the sides of the core were the actual sides of a quadrant, which were increased and diminished by regarding them as lines and cosines of that quadrant; and by making the sides of the two halves even with filling the lower half with thicker casing stones? Hence, Mr. Petrie is compelled to come to the conclusion that the core masonry is askew with the true base. He says: "The main skew of the core to the base is 1′ 33″, and its mean azimuth—5′ 16″ to true north," p. 41. And on Plate X, with the diagram of the base as computed by him, he says: "The *azimuths* of the sides stated are from the *mean azimuth* of the casing on pavement, which is—3′ 43″, *i. e.*, W. of N." But his pavement level has an unknown quantity of probable error in it that makes it unreliable. He says, p. 42: "The pavement levels, excepting that on the N. side below the entrance, are not of the same accuracy as the other quantities; they were taken without an assistant, merely for the purpose of showing that it really was the pavement on which the casing was found to rest on each side." The core-plane on pavement, as given by him, has, therefore, an unknown quantity of error in it. And this item, which ought to have been the most completely established as the zero and datum line of all the levels in the upper courses of masonry, is the least reliable, according to his own showing. We have no doubt that the mean azimuth of the casing on pavement was exactly the mean azimuth of the whole Pyramid, namely, 5′ 16″, west of north, or more correctly, 5′ 12.525″, as we have estimated it, no matter what the main skew of the core to the base might be. It is altogether inadmissible to suppose, as Mr. Petrie does,

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that the architect and builder would adjust correctly the casing to the core masonry to make a perfect alignment and smooth face to each side, and do it with the utmost perfection and finish, and not adjust the casing and pavement level with equal alignment, perfection and finish. His diagram is therefore faulty and erroneous in the azimuth of the casing on the pavement. If the corner sides of core masonry were constructed as the two sides, sine and cosine, of a quadrant, as we have already proven, then it would have been next to an impossibility that the mean azimuth of the casing on the pavement could be what Mr. Petrie has given to it. We cannot for a moment admit it; and the more so because he admits that the pavement level on the N. side below the entrance was more accurately taken by Col. Vyse. The fact is, Mr. Petrie had no reliable formulæ to rest on as a guide and key to unlock the mystery before him, and to control his calculations. For this question of base, datum line, zero of levels, or foundation of the great structure, has been with him a matter of speculation rather than actual observation or measurement.

Indeed, this theory of the true trigonometrical structure of the Pyramid base is capable of the most exact demonstration, and of the widest and most fruitful illustration. Its discovery will enable us in future to employ a system of triangulation of a different character, such as has not yet been applied to the Great Pyramid. And I would recommend that the Institute organize an expedition for that purpose at as early a date as possible. I am now certain it will be impossible for that expedition to fail doing more satisfactory work, for the settlement of difficult points and theories, than any yet done. It can be equipped with perfect formulæ for its guidance, such as no other has ever yet possessed. We have the advantage of having tested them by comparing the results they give us with what has been done under the most favorable conditions, with the best appliances, and directed with admirable precision and skill. And we have found those results more reliable, because nearer the best averages, than any results yet attained. We have the advantage of knowing beforehand what the average positive success must be, from what has already been attained

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with less effective formulæ as a guide. I cannot use too strong language in urging upon the Institute the immediate organization of such an expedition, and upon its wealthy members and friends the duty of furnishing the means to equip and support it in the work to be done.

We can now say, as we could never say before, that no merchant ever made an investment with more certainty of success.

S. Beswick.

Strathroy, Ontario, March 1, 1884.

REFLECTIONS CONCERNING THE SO-CALLED "π" VALUE.

BY THEODORE FABER, BROOKLYN, N. Y.

The "orthodox" view of the "relation" between the diameter of a circle and that circle's circumference is, that it is an *infinite* relation. Has this view any *sound* basis?

"Relation" is a word which any reflective mind will readily allow can solely be applied where *difference* exists. If the universe consisted of one absolute infinite formless space, no "relation" could be conceived to exist there. Hence, that word is, geometrically, solely applicable to "form" and its *motion* in space.

The diameter of "a circle" and the circumference of the same *form* are virtually "abstractions" which we *image*, for instance on paper, and apply our minds to define and *measure* their "*relations*"—for what purpose?

Astronomy has been one of the oldest sciences. Man could not help early noticing the regular motions of bright "spheres" in the "heavens," and the influence these exercise on his own being. It became an early object of man's intelligent mind to investigate "nature," and to learn to comprehend as much as possible of the *relations* of *moving forms* in space. Man early *imagined* the *geometrical forms*, such as globe and cube, and their divisons, which soon became permanent objects of special

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study. Why? Because it soon became obvious to man that law presides in the Universe, *i e.*, *perfect order* in the motions of all *forms* in space, as if under the control of One Infinite Intelligence. And where man discerns any *true* geometrical relatiou on earth, he may fully rely on its universal validity. If it were not so, of what possible practical use would be to him the study of all nature and her laws?

We *image* the circular motion of small forms round larger, and such for instance as that of the moon round the earth and that of the earth round the sun, by "*circles*," and call the *distance* across—dividing the circle into two equal semicircles—the *diametcr* of the circle; and what the *circumference* of a circle means, any one knows that has ever described a circle with a pair of compasses. We desire, for instance, to know the distance from the earth to the sun, and that of the orbit of the earth round the sun. It soon becomes obvious that we must first clearly understand the true relation between the diameter and circumference of an abstract circle before we can hope to make any approximately correct calculation at all in astronomical science. The orthodox view of the relation between the two objects has hitherto been that it is *infinite*, and the value of "π," what is, the relation between the *diameter* and *circumferencc* of the circle is=1:3. 14159+. . . . . to infinity. The question looms up. "Can this be called *sound* doctrine?" Is it indeed "common sense" to assume the relation between two such elements of *form* as the diameter and circumference of "a circle" as *infinite*? Even though all space could be *imaged* by a circle, the two elements of the *imaged form* would *never* be *infinite*. It is impossible for man to image or comprehend the *Infinite*. Hence, it would seem to constitute actually treason to common sense to call any other relation but *a finite one true* between diameter and circumference of a circle. And unless the relation be universally valid, that is, even identical in the smallest conceivable as well as in the largest possible circle, what reliance could at all be placed in any astronomical calculation soever?

The writer's ratio 9: 8 between circle diameter and square root of circle area and 1:$3\frac{1}{8}\frac{3}{1}$ between circle diameter and circle circumference, discovered after many years of ardent reflections,

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finally virtually *prove*, beyond all power of refutation, the solution of the "Grand Problem" as Chambers Encyclopedia calls it, namely the quadrature of the circle, so intensly sought after in vain for so many ages, that two great scientific societies finally, some seventy years ago, were tempted to pronounce the solution "impossible," although such dictum found itself based on no other ground than the fact of its still remaining unsolved.

A thorough explanation of the ways and means which led the writer to final success in making the great discovery of the solution of the famous problem, and this in the face of the dictum of the two great scientific societies, would seem to be due to the world's public at large, but more especially to that of the discoverer's adopted country, a nation which is finally to decide whether there is any value or national honor in the great discovery.

The ratio "9:8" is a more simple expression than that of 2¼:2, which latter was found by analysis of the primary right angle 2:1, in the following manner: Assuming the first following square to the unit "1" namely 2^2, and drawing a straight line from the middle of its summit side to either angle of the base side, the line divides the assumed square into two unequal parts, the smaller of which constitutes a right angle triangle, the two sides of which obviously are 2 and 1. The question arrives, what is the hypothenuse of the triangle? According to the "Pythagorean problem," the sum of the square of the two sides of the right angled triangle is equal to the square of the hypothenuse. Now, what would be that square in given case? The sum of $2^2 + 1^2$ is=5 which is *a surd* or *irrational* quantity, from which no clear *square root* can be extracted, because an irrational quantity is ever only=a^2+2 a b, lacking b^2 from constituting *a square*. Hence, if we would have the true hypothenuse of the given right angled triangle, we must add b^2 to the sum "5." The writer himself discovered a rule for finding what he called the "artificial root" of "irrational quantities," as follows:

1. Extract the largest *square* from given irrational quantity.

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2. Subtract the extracted square from given irrational quantity.

3. Use the difference for the *numerator of a fraction*, of which *twice* the root of extracted square shall be the denominator.

4. Add this fraction to the *root* of the *extracted square*.

5. Now, *square* the found artificial root, and the result will invariably be = to given irrational quantity—plus square of the *fraction*—and the found artificial root will constitute the "hypothenuse," which in given case is = 2¼.

Now, if we use this hypothenuse for radius of "a quadrant," what will be its relation to the *large side* of the right angled triangle 2:1? Evidently 2¼:2. Now, obviously the relation between the quadrant radius and the large side of the triangle is precisely similar to the relation between the circle diameter and the *square root of the circle area*. But 2¼:2 is = 9:8, which latter is a more simple ratio, more easily handled, and this fact has to be set down as an axiom: whatever ratio is the *true* one in a single circle must necessarily be valid in all circles. But how did the writer arrive at the ratio 1:3 13-81 as between *diameter* and *circumference* of a circle? By the very ratio 9:8! What is the square root of the circle, whose *diameter* is 1? Answer: As 9:8 :: 1:8-9—*i. e.*, 8-9 is the $\sqrt{\ }$ of a circle of diameter = 2, it will be exactly double of 8-9—that is, = 1 7-9, and 1 7-9² = exactly 3 13-81. But what makes the *area* of a circle of diameter "2" exactly = circumference of a circle of diameter 1? Because it is the *law* of harmony between measure and number, which Euclid theoretically discerned, when he declared his proposition, that the product of half a circle's circumference, and the circle's radius, is equal to the circle's "area," although he could not find the numerical ratio between diameter and circumference. Curious enough, by the writer's "Table of Proof" it is distinctly seen that this proposition of Euclid holds good *in every case* exactly, an absolute proof of the correctness of the ratio 1:3⅛. The proposition of Euclid is virtually tantamount to the finding of the *circle area* of diameter 2 as exactly equal to the circumference of circle of diameter 1.

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The writer finally made the discovery that the circle area stands in an *invariable* relation to the area of the square of the circle diameter, namely in this: as diameter square is $= a^2 + 2ab + b^2$, the circle area is ever $= a^2$ of this formula; but a^2, as its very name indicates, is *a square*. Hence, it follows, that every circle area is equal to *a square*, and thereby *proves* the *solution* of the "*Grand Problem.*" Every assumed circle-diameter will bring us out in this theory with wonderful precision, as per examples here presented.

1. By our ratio 9:8 as between diameter of circle and square root of circle-area—assuming diameter as = 9, the square root of the area will be = 8, and therefore the area $= 8^2 = 64$, while the square of the diameter 9 will be $= 81 = a^2 + 2ab + b^2$.

$$\text{Now } 8^2 = 64 = a^2$$
$$2 \times 8 \times 1 = 16 = 2ab$$
$$1^2 = 1\text{-}81 = b^2$$

2. Let us now assume a circle-diameter = 100, then the square of the same is $100^2 = 10{,}000$. What is the circle-area according to the ratio 9:8? As 9:8 :: 100:88 8-9, therefore the circle-area will be $= 88\ 8\text{-}9^2 = 7901\ 19\text{-}81 = a^2$. The difference between 100 and 88 8-9 is 11 1-9, and this difference multiplied by twice the root 88 8-9 is = 1975 25-81 = 2 a b, and the square of the difference, namely, $11\ 1\text{-}9^2 = 123\ 37\text{-}81$ is $= b^2$. Now, these three amount, namely,

$$7901\ 19\text{-}81 = a^2$$
$$1975\ 25\text{-}81 = 2ab$$
$$123\ 37\text{-}81 = b^2$$
$$\text{are } 10{,}000 = 100^2$$

and thus in every case of application, thereby *proving* the *absolute truth* of the *circle-quadrature* beyond all power of refutation!

The discoverer himself is filled with wonder every time he makes the application with his ratio 9:8, namely with wonder, that this simple truth had not been discovered before; but he discerns the insidious cause by which even Euclid was misled in the practical carrying out—while he had a correct insight theoretically, demonstrating even the logical necessity of the circle-area being equal to a square. This insidious cause resided

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in a false assumption of *universal* validity of the famous "Pythagorean Problem," finally found to be only a special one. The long-prevailing ignorance of "Science" of the fact, that a so-called "*irrational quantity*" can ever only be $= a^2 + 2\,a\,b$, had a great deal to do with the difficulty of "squaring the circle"!

After all, the difference in "value" between the *finite* ratio 1:3 13-81 and the orthodox *infinite* 1:3.14159+ . . . does not much exceed 3-5 %, but, when we come to consider that already 707 decimals have been added to the same infinite ratio, while billions of decimals added to the same would scarcely change the *per centage* of difference, it would seem to be childish to deny the *advantage of the finite ratio*. The ratio 10:9 has recently been proposed. This would change the ratio between diameter and circumference to 1:3 24-100 instead of 1:3 13-81, virtually the difference between the metric and anti-metric system of measurement!

COPY OF TABLE OF PROOF IN SUPPORT OF THEODORE FABER'S TWO RULES FOR SQUARING THE CIRCLE.

Conversion Ratio.	Circle Diameter.	Square Root of Circle Area.	Circle Area.	Ratio between Diameter and Circumference.	Circle Diameter.	Circumference.	Half Circumference.	Radius.	Circle Area.
9:8	1	$(\frac{8}{9})^2 =$	$\frac{64}{81}$	1:$3\frac{13}{81}$	1	$3\frac{13}{81}$	$1\frac{47}{81}\times$	$\frac{1}{2} =$	$\frac{64}{81}$
	2	$(1\frac{7}{9})^2 =$	$3\frac{13}{81}$		2	$6\frac{26}{81}$	$3\frac{13}{81}\times$	$1 =$	$3\frac{13}{81}$
	3	$(2\frac{6}{9})^2 =$	$7\frac{8}{81}$		3	$9\frac{39}{81}$	$4\frac{60}{81}\times$	$1\frac{1}{2} =$	$7\frac{8}{81}$
	4	$(3\frac{5}{9})^2 =$	$12\frac{52}{81}$		4	$12\frac{52}{81}$	$6\frac{26}{81}\times$	$2 =$	$12\frac{52}{81}$
	5	$(4\frac{4}{9})^2 =$	$19\frac{81}{81}$		5	$15\frac{65}{81}$	$7\frac{37}{81}\times$	$2\frac{1}{2} =$	$19\frac{81}{81}$
	6	$(5\frac{3}{9})^2 =$	$28\frac{33}{81}$		6	$18\frac{71}{81}$	$9\frac{32}{81}\times$	$3 =$	$28\frac{33}{81}$
	7	$(6\frac{2}{9})^2 =$	$38\frac{44}{81}$		7	$22\frac{10}{81}$	$11\frac{5}{81}\times$	$3\frac{1}{2} =$	$38\frac{44}{81}$
	8	$(7\frac{1}{9})^2 =$	$50\frac{48}{81}$		8	$25\frac{23}{81}$	$12\frac{57}{81}\times$	$4 =$	$50\frac{48}{81}$
	9	$(8)^2 =$	64		9	$28\frac{36}{81}$	$14\frac{18}{81}\times$	$4\frac{1}{2} =$	64

Rule 1. Convert any given circle-diameter by the raito 9,'8 and you have the exact square-root of the circle-area.

Rule 2. Multiply any given circle-diameter by the mixed number three and thirteen-eighty-firsts ($3\frac{13}{81}$) and you have the exact circumference of the circle.

1. Draw an accurate square.

2. From middle of summit side of the square to either angle of the base side, draw a straight line which divides the square into two unequal parts, the smaller of which constitutes a right angled triangle, the two sides of which stand obviously related

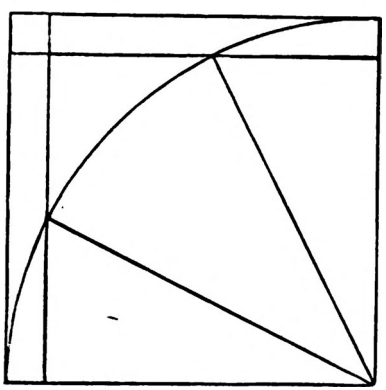
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to each other, as 2:1, thus constituting the *primary right angle*, the hypothenuse of which is *solely* expressible in a *finite*, and *not* in an *infinite* line, and when the *sum of the squares* of the two *sides* of the right angle constitute "*an irrational quantity*," the "artificial root" of that quantity, as obtained by Faber's rule, constitutes the "hypothenuse."

3. Now, using the hypothenuse for a radius, and moving the same to the left till it fall *in line* with the perpendicular side of the posited square, and moving it to the right till it fall in line with the base side of the same square, we have then "a quadrant."

4. Complement now the *square of the radius*. The question arises; what *relation* does the *area of the quadrant* bear to that of the first posited square? And what is the square of the radius?

Since the arc of the quadrant obviously cuts off a corner from the first posited square, and deposits the same quantity in two equal half arcs between the posited square and the square of the



radius, it becomes self evident that the first deposited square, and the quadrant are of perfectly equal area, and consequently that the quadrant area, in every case, bears the same proportion to radius square, that the first posited square bears to the same, namely, it is $= a^2$ of the $a + b^2$ of the radius ^{2}.

Now, the "quadrant" being simply the *exact fourth part of a circle*, it follows that the identical relations apply to the *whole*, that is: The circle-area is ever exactly equal to a^2 of the square of the diameter, the same as the quadrant area is

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exactly equal to a^2 of radius-square. But "a ²," as its name readily indicates, is "*a square*," as much as "radius square" is "a square," and as much as circle diameter ² is *a square*. This fact irrefutably establishes the solution of the "Grand Problem" of the circle-quadrature.

But what makes the 2 a b invariably=to product of twice the *square root* of quadrant area or of circle-area, and the *difference* between radius and square root of area? Because that is the exact content of the two parallelograms between the two squares, and b ² consists of the square of the difference in the square roots of the two squares.

Thus, forever, most beautifully "*harmonizing measure and number*" never before accomplished.

Faber's ratio 9:8 between circle-diameter and square-area, wonderfully facilitates each calculation rendering the use of "*decimals*" fallacious.

WILLIAM OSBURN, THE EGYPTOLOGIST OF LEEDS, 1793–1875.

William Osburn, whose portrait, at an advanced age, we now reproduce for our readers, from a photograph taken and presented to us by a once Sunday-school pupil of his, now a photographic artist in Leeds (W. Hanson), was born in that city in 1793. After having received a good classical education in the local schools, he pursued for himself still further the study of various branches of ancient literature, both Latin and Greek; rejoicing in trials of intellectual strength with the best scholars of his time on the most difficult passages in Sophocles, Æschylees and Euripides. But, without fortune, he must do something more profitable for daily bread; wherefore, much against his own tastes, and the recommendations of those who had taught him, he entered into his father's business, which was that of a wine merchant.

Wearily and not successfully did he plod on at that occupation for nearly thirty years, vexing his friends by his total in-

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capacity, as well as want of appreciation for "commerce," and giving himself up greatly to voluntary evening teaching to a large class of young men connected with a neighboring church. There he was most successful, forming them year after year, some into earnest school-masters (who were then greatly wanted in Leeds), and some into most devoted missionaries to carry the gospel into distant regions of the earth: so remarkable and powerful the influence he was gifted with by Nature, to obtain over the ingenuous, youthful mind.

But he by no means confined himself to elementary teaching of the young, for, being of strong evangelical views in religion, and having studied the old ecclesiastical literature deeply in the originals, he felt himself moved, when the High Church Oxford tracts came out under Pusey, Newman and others, to publish a work entitled, 'Errors of the Early and Apostolic Fathers,' in which book, by means of copious quotations from their writings, he was enabled to show the very early introduction of serious corruption and superstition in the Christian churches, both Latin and Greek.

His essay, though, however good in itself, obtained for him through the rest of his life the cold shade of the political leaders and government ministers connected with that Oxford movement. While his following works, 'The Life of Origen' and 'Hidden Works of Darkness, or History of Jesuitism,' so angered the Jesuits, that one of them (whom all scientific men would never have believed capable of such an act) tried to turn the tables upon him by declaring that William Osburn was, himself, that odious thing to free humanity "a dispensed Jesuit."

By this time (1847) William Osburn had not only left the unfortunate wine merchant business in Leeds, but, after having been called to be, and having practised as, a newspaper editor in Manchester, and published on the 'Antiquities of Egypt,' the ancient hieroglyphics of that land and its modern Coptic language—of which he finally produced a dictionary—he was invited by the Rev. Lord Wriothesley Russel (a scion of the politically liberal house of the Dukes of Bedford) to become a private tutor to his two sons. This employment took Mr.

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Osburn much away from his own growing family (for he had married in 1829), but was too congenial to his mental gifts to be disregarded. He accordingly became a travelling tutor to these young men, and afterwards to a son of Sir John Dean Paul, with whom he visited not only the chief cities of Europe but Egypt and Ceylon, whence he was enabled to publish his highest researches in both Egyptology and revealed religion in the shape of his 'Israel in Egypt,' in 1853; 'Monumental History of Egypt,' 1854; and 'Religions of the World,' 1855.

The above account is taken with very little alteration or addition by us from an excellent notice in the Leeds *Mercury*, for February 27, 1875, written, we believe, by its editor-in-chief, that able and widely-respected liberal politician and educationist, Mr. Baines. And what follows is taken *verbatim* from the same source, for we believe that it cannot be improved upon, even for our especial purpose of showing why William Osburn's portrait has been introduced into our International's gallery of worthies in science and religion, students of the Great Pyramid.

Thus, then, in winding up his account of the last days of a most striking existence, continues the editor of the Northern paper—

Owing to his long illness (acute and extensive chronic rheumatism) Mr. Osburn had withdrawn for many years from public life; indeed, only a comparatively small circle of surviving friends knew that he was still alive until yesterday. Eight years ago reference was made in the *Mercury* to the fact that the Astronomer Royal for Scotland had then written of the important and difficult researches of the deceased under the belief, then widespread, that Mr. Osburn was dead. Alluding at that time to Mr. Osburn's volume entitled the 'Monumental History of Egypt,' we wrote: "This work failed to take its proper position at the time of its publication, being both reviewed in a most unfriendly spirit by persons who ought to have sympathized in its author's object; and being unfortunate in its publisher, who became bankrupt while the work was in progress. Its detractors doubtless chuckled when Chevalier Bunsen, in his book on Egypt, discredited Mr. Osburn's views as 'of no value whatever.' Ten years more have elapsed, and within the last two

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or three of them readers, both learned and unlearned, have been deeply interested by the publications of Professor Piazzi Symth on the Great Pyramid. References to our townsman's slighted work are scattered over 100 pages of this writer's latest volume; and they have not only the weight derivable from the name of the distinguished author, but something like the impartiality of a verdict of posterity, the learned writer being under the misconception that Mr. Osburn no longer lives." It is now due to Mr. Osburn's memory that some portion of this testimony to the importance and value of his labors and their results should be quoted, and we therefore make no apology for extracting the most noticeable passages concerning him from Vol. III of 'Life and Work at the Great Pyramid':—then

"The whole monumental conclusion, formed by combining the quarry marks of the Great Pyramid with whatever is to be trusted, or is tolerably agreed upon among Egyptologists, and both of them with our astronomical date of the building, can be no other than that two of the kings of the fourth dynasty of Egyptian history, Shofo and Nu-Shofo by name, lived through a period including the epoch of 2,170 B. C., when the pyramids were being built. Mr. Osburn, the one historian into the very middle of whose date and duration for the fourth dynasty of Egypt the epoch 2,170 B. C., falls, was only brought to our attention recently, and then by an accident; but, after having experienced something of the earnestness of his manner and thoroughness of his style of investigation, we procured one after another of his works, tracing thereby the growth of his knowledge of Egypt, her monuments, and both ancient and modern language, continually increasing through a long period of years, until it may be considered to culminate in his 'Monumental History of Egypt,' published in 1854.

His grand and abiding purpose appears to have been to ascertain if the unlocking of the written materials of Egypt, by Champollion's method of interpreting hireoglyphics would disclose any trace of the sojourning of the children of Israel in the Nile land, or anything bearing on the Bible records of early events transacted therein or connected therewith. 'Is it not marvellous that they can now read the old Egyptian readily,

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and understand its grammar? These Egyptian discoveries are likely to be one of the greatest wonders of our age' had written the late Dr. Arnold; and William Osburn pressed forward in his younger life with a youthful enthusiasm which did not tire during 30 years of devotion to the task, in order to acquire this power of reading and of grammar, that it might be employed on the one chief object of his life. To prepare himself worthily, therefore, for his subject, he appears to have visited Egypt, made himself well acquainted with its physical features and climatic experiences, studied its measurements *in situ*, and copied hieroglyphics with his own hand, over and above the never ceasing task of making himself familiar with all the idiomatic particulars of the Coptic language, the extensions of hieroglyphic interpretation-methods, the works of modern hierologists, and remains of all authors of antiquity who have treated on Egypt.

Hence, while he is often going over the same ground as Gardner, Wilkinson, Rosellini or Lepsius, there is a difference in his manner. With him no dallying by the wayside, entranced by vivid details of private life in ancient times, or the skill of ancient workmen, or the aften intricate details of idol and animal worship; that is, for their own sakes, for he does not neglect such topics altogether, but keeps them in due subservience to his own grander objects of pursuit, and estimates their true value by the light of a more advanced civilization and a purer religion.

To trust no one of intervening time seems to be a notable principle with him; and, after sifting to the utmost all that has came down to us from Alexandrine Greeks, his principal labor begins with unravelling the tissue of fictitious history composed by the ancient Egyptian priests, and recorded by their despotic monarchs on the exteriors of their temples in a land of eternal slavery, where none dared openly contradict what was appointed to be inscribed.

For this remarkable purpose Mr. Osburn makes abundant use of the hieroglyphics found on private tombs sealed up in their own day, and only recently disclosed by excavations; but thereby in their turn unfolding for the first time the opposite side to

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the official side of Eyptian history. And delightful is it to observe his astonishing facility in dealing with the hieroglyphic characters of every age, and in either large or small amount."

In other passages of his work, Professor Smyth claims an honorable position for the late Mr. Osburn amongst our philologists of reference, describing him as a man of peculiar talent, high resolve, noble purpose, and magnificent ideas of devotion in a good cause. During long years of solitary and unsympathized toil, the deceased labored in laying down a broader and more secure track over the morass of doubt and dark pits of oblivion which beset man's present knowledge of the affairs of the world as transacted from thousand years ago.

PERSONAL RECOLLECTIONS OF WILLIAM OSBURN, AUTHOR OF THE MONUMENTAL HISTORY OF EGYPT, BY WILLIAM HANSON, PHOTOGRAPHER, GREAT GEORGE STREET, LEEDS.

I was first introduced to Mr. Osburn in the year 1850, and the impression I then received of his personal appearance is that of a portly gentleman of middle height, with a genial expression of countenance, and a manner that was simplicity itself. My sphere in life has not brought me in contact with many persons of eminence, but I well remember speaking to one (Professor Owen) whose singular freedom from affectation, Mr. Osburn's manner much resembled. I never read "Pickwick" without being reminded of some of his *lighter* characteristics.

Mr. Osburn commissioned me to prepare the plans and illustrations for his 'Monumental History of Egypt,' and this work kept me in close communication with him for a long time, so that my first impression was well tested, and I am glad to be able to add that it did not change. After many years of intimate acquaintance he was still the same good natured, sincere, humble, *gentleman* I first saw.

Mr. Osburn looked forward with much hope to the publication of his "history," and often talked about future labors in Egypt, when he was to make fresh explorations and copy more inscriptions. But, alas! the very cold reception accorded to

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the said "History" when it left the press, blighted all his hopes, while the catastrophic end of his much trusted former friend, Sir John Dean Paul, left him without further means to realize any of the plans he had conceived, indeed barely enough to live on. For sometime he bore up against the bitter disappointment, but, I am disposed to think that it proved fatal not only to his future Egyptological schemes but to his health and life eventually, his remaining years being passed first in illness and then in helplessness, suffering and neglect, till death put a period to all his troubles here, on Friday the 26th of February, 1875.

From the time of the preparation of his 'History' to the year 1864, I was a constant visitor at his lodgings, when he was not in York or Jersey; and the hours passed in his society are now among the most pleasant and improving of my recollections. His conversation was generally instructive and always interesting, never dull or common place. It was continually enlivened with wit, and frequently graced with fine imagery.

Mr. Osburn was perhaps more of a poet than a scientific philosopher. He seemed often to grasp a conclusion more as by inspiration than by patient labor, owing no doubt to the extreme quickness of his mental faculties, and his strong, animated, even vehement feelings. He had the bitterest hatred of Roman Catholicism, founded on the corrupt practices which he had witnessed at Rome and other places. He held through life steadily to the church of England, yet so liberally that he frequently attended the service at Queen Street Independent chapel during the ministry of the Rev. William Guest, a preacher whom he greatly appreciated and admired.

Mr. Osburn was quite lost to outward things when his mind was bent on any subject; and on one occasion, at the chapel just named, he so far forgot himself, that he attracted the particular notice of an old gentleman who occupied a pew behind him, by assenting to the sermon very freely with nods of his head, and other motions of the body, but which were sadly misunderstood, for the elderly gentleman referred to afterwards proved the pungency of the preacher's matter by telling a party of his friends that evening that it had made a

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portly stranger in front of him sit very uncomfortably on his seat.

Mr. Osburn's spiritual life, during his terribly painful rheumatic afflictions was one often of great conflict and trial; but his faith in God's word was steadfast; and he was accustomed to say "great faith shall have great trials."

On one occasion I found him much distressed in mind, and he repeated that remarkable hymn of Newton's, beginning:

> "I asked the Lord that I might grow
> In faith, and love and every grace;
> Might more of his salvation know,
> And seek more earnestly His face."

Never shall I forget the deep, passionate earnestness in which he spoke the whole words of the hymn. His face was upturned, the tears rolled from his eyes, and his whole frame shook under the strain of his intense feeling. For the moment he was a sublime spectacle, but a very solemn one, for he was crippled at the time by his rheumatic sufferings to such an extent that his old age had become like that of St. Peter, his garments bound about him by unsympathizing hands, and himself led to places he did not desire.

On another occasion of somewhat less suffering, he read, from Milton's "Paradise Lost," the expulsion from the garden; but was so overcome that he could not finish the passage. I spoke to him of a bishop who was said to have committed the whole of this grand poem to memory, whereupon he replied: I do not doubt the statement, for if the first book of it were lost I could myself replace it from memory.

Another time I found him just finishing the perusal of Colenso on the Pentateuch. He closed the book and pushed it from him, saying with much vehemence—"I never was more convinced of the truth of this blessed book (the Bible)," and continuing, "Dr. Thompson's answer to Colenso is the best I have seen." About this time he read to me a short poem of his own, on "Simon the Cyrenian bearing the Cross," which greatly moved me.

Mr. Osburn was passionately fond of music, and he particularly admired the compositions of Mr. Bishop. Under the influence of music he used to pace the room and look very ab-

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stracted. I think it acted as a stimulant to his thoughts.

Martin Luther found in him an enthusiastic admirer. He loved to read the "Table Talk," and delighted especially in its strong denunciation of the Popes. I should think that in temperament he much resembled the German reformer, at any rate he most cordially reciprocated Luther's detestation of shame and fraud in religion.

Among other things he so heartily hated was slavery. I never heard him speak on this subject without warmth. It moved his whole being to talk about the horrors of bondage. During the struggle between the Northern and Southern States of America he prayed night after night, when he could not sleep, that the former might prevail. So he expressly told me. He always spoke of Abraham Lincoln in terms of praise, and seemed to have a real affection for the good President's simple nature and honest purpose. Speaking of the slavery sometime *before* the war broke out, he said: "That is an account which will have to be settled in *red* ink."

As regards art, Mr. Osburn possessed a highly cultivated taste and sound judgment. He was exceedingly quick to appreciate merits or detect faults in a picture. He made no pretence of understanding the technicalities, but quickly recognized the higher qualities of art when they were present. The works of Raphael, Murills, Velasquez, Van Dyck, Slr Joshua Reynolds and Gainsborough (particularly the blue boy) afforded him much enjoyment. He spoke of John Ruskin as a "wonderful creature," and praised his "Stones of Venice" highly. Still I am disposed to think he loved the rude figures traced on the Monuments of Egypt, whenever he could trace their testimony to the truth of primeval history as given in the Bible, more than all these.

On one occasion he asked me to accompany him to hear the Rev. W. M. Punshon preach. When leaving the chapel, after the service was over, he ejaculated:

> "Weave a circle round him thrice,
> For he on honey-dew hath fed,
> And drunk the milk of Paradise."

Mr. Punshon is a heaven-born orator."

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Mr. Osborn had no capacity for public speaking, though he came so near it as to dictate to an amanuensis the subject matter, or contents, of his subsequently most successful books.

In fact his only absolute failing through all his life, excepting those matters of science, mathametical, mechanical and natural, which he did not pretend to go into, was, his total want of business qualifications for the art of making money. A banker in our city once said of him: "He is a great man, but he cannot distinguish between a sovereign and a shilling." This failing of course was a very serious one in the eyes of a trading community like that of Leeds, and was a main cause why his real merits were known to so few.

These fragments may not be much in themselves, but they will serve to show the man as he appeared to me.

WILLIAM HANSON.

Leeds, Nov. 22, 1883.

LIVES WHICH LIVE.

A SERIES OF BIOGRAPHICAL REVIEWS, BY THE REV. TIMOTHY HARLEY, F. R. A. S. LONDON, I. SIR JOHN HERSCHEL.

As we have already published Rev. Charles Pritchard's memoir of Herschel, we will give here some of Mr. Harley's selections from Herschel's works. He says: "We are struck with the versatility of his genius, which, without the least indication of unsteadiness, could turn in various directions, obedient to the currents of truth. What Dr. Johnson wrote of Oliver Goldsmith may justly be applied to Herschel: 'He left nearly no style of writing untouched; and he touched nothing which he did not adorn'"

In a critique of No. 99 of the *Quarterly Review*, on the "Mechanism of the Heavens," after alluding to the possible effects of "other conceivable laws of central force" than the law of gravitation, he finely says, with the humility which marks the highest order of mind:—"We may please ourselves with such speculations, and enjoy the beauty and harmony of their

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results, in the very same spirit with which we rejoice in the contemplation of an elegant geometrical truth, or a property of numbers, without presumptuously encroaching on the province of creative wisdom, which alone can judge of what is really in harmonious relation with its own designs. The stability of our actual system, however, rests on a basis far more refined, and far more curiously elaborate. It depends, as we have before observed, on no nice adjustments of quantity, speed, and distance. The masses of the planets, and the constants of their motions, might all be changed from what they are—within certain limits—yet the same tendency to self destruction in the *deviations* of the system from a mean state would still subsist. The actual forms of their orbits are not ellipses, but spirals of excessive intricacy, which never return into themselves; yet this intricacy has its laws, which distinguish it from confusion, and its limits, which preserve it from degenerating into anarchy. It is in this conservation of the principle of order in the midst of perplexity— in this ultimate compensation, brought about by the continual action of causes which appear at first sight pregnant only with subversion and decay—that we trace the master-workman with whom the darkness is even with the light."

In his presidential "Address to the British Association for the Advancement of Science," at Cambridge, in 1845, Sir John Herschel concluded with this beautiful peroration: "True science, like true religion, is wide-embracing in its extent and aim. Let interests divide the the worldly and jealousies torment the envious. We breathe, or long to breathe a purer empyrean. The common pursuit of truth is of itself a brotherhood. In these our annual meetings, to which every corner of Britain—almost every nation in Europe—sends forth as its representative some distinguished cultivator of some separate branch of knowledge; where, I would ask, in so vast a variety of pursuits which seem to have hardly anything in common, are we to look for that acknowledged source of delight which draws us together and inspires us with a sense of unity? That astronomers should congregate to talk of stars and planets—chemists, of atoms,—geologists of strata—is natural enough; but what is there of *equal* mutual interest, *equally* connected with

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and *equally* pervading all they are engaged upon, which causes their hearts to burn within them for mutual communication and unbosoming? Surely, were each of us to give utterance to all he feels, we would hear the chemist, the astronomer, the physiologist, the electrician, the botanist, the geologist, all with one accord, and each in the language of his own science, declaring not only the wonderful works of God disclosed by it, but the delight which their disclosure affords him, and the privilege he feels it to be to have aided in it. This is, indeed, a magnificent induction— a consilience there is no refusing. It leads us to look onward, through the long vista of time, with chastened but confident assurance that science has still other and nobler work to do than any she has yet attempted; work which, before she is prepared to attempt, the minds of men must be prepared to *receive* the attempt—prepared, I mean, by an entire conviction of the wisdom of her views, the purity of her objects, and the faithfulness of her disciples."

Mr. Harley concludes his memoir with a selection from Herschel's poems. It is entitled

"MAN THE INTERPRETER OF NATURE."

Say! when the world was new and fresh from the hand of its Maker,
Ere the first modelled frame thrilled with the tremors of life,
Glowed not primeval suns as bright in yon canopied azure,
Day succeeding to day in the same rhythmical march;
Roseate morn, and the fervid noon, and the purple of evening—
Night with her starry robe solemnly sweeping the sky?
Heaved not ocean, as now, to the moon's mysterious impulse?
Lashed by the tempest's scourge, rose not its billows in wrath?
Sighed not the breeze through balmy groves, or o'er carpeted verdure
Gorgeous with myriad flowers, lingered and paused in its flight?
Yet what availed, alas! these glorious forms of creation—
Forms of transcendent might—Beauty with Majesty joined,
None to behold, and none to enjoy, and none to interpret?
Say, was the work wrought out? Say, was the Glory complete?
What could reflect, though dimly and faint, the ineffable purpose
Which, from chaotic powers, Order and Harmony drew?
What but the reasoning spirit, the thought and the faith and the feeling?
What, but the grateful sense, conscious of love and design?
Man sprang forth at the final behest. His intelligent worship
Filled up the void that was left. Nature at length had a soul.

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*A SUCCINCT HISTORY OF THE INTRODUCTION AND ESTABLISHMENT OF THE DECIMAL SYSTEM IN FRANCE.

For centuries thinking men in European nations had been dissatisfied with the uncertain character of the units which formed the basis of the various scales of measure, and they desired to discover some invariable principle in nature suitable as a standard unit.

In 1658, the Dutch Astronomer, Huygens, published a work entitled, *Horologium Ascillatorium, Sive de Motu Pendulorum.* He recommended the length of the pendulum of a clock, vibrating seconds of mean time, as an *invariable* unit. This work came under the notice of the celebrated Picard, who zealously advocated the views of his contemporary; but, a short time before his decease, it was discovered that the length of the pendulum varied with the latitude. This discouraged the philosophers for nearly half a century till Cassini suggested that a unit derived from the magnitude of the earth would be more likely to prove invariable than any other. This hint of Cassini issued in the production of the metrical system; it aroused the attention of a French astronomer, M. Mouton, who flourished near the middle of the last century. He proposed that a *minute* of a degree of the meridian should be taken as the *superior* unit, from which all other measures should be derived, proceeding in a subdecuple series. To him belongs the honor of promulgating *the first idea of applying the decimal system to measures of quantity.*

M. De La Condamine, who had been employed in measuring a degree of the equator in Peru, revived the pendulum scheme; his aim was to make the length of this instrument a standard unit of quantity for the whole world, and he recommended the equator as a suitable position whence it might be taken. But

* Abridged from the 'Decimal System' by Jno. H. Felton.

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Condamine died, and his scheme lay dormant for forty years. Talleyrand then brought the pendulum theory again before the world. He submitted it to the Constituent Assembly in the year 1790, and procured the appointment of a committee, consisting of Borda, Lagrange, Laplace, and others. They considered the pendulum deficient in those properties required in a perfect standard, and preferred taking a unit from the earth's magnitude. The report of this commission issued in the introduction of the decimal system. It recommended that the distance between the equator and the pole be divided into ten millions of equal parts, and that one of these parts form the length of what should be considered as the grand standard unit of quantity to be called the metre, from which, by decimal multiplication and division, all other quantities on the scale of length should be derived.

To M. M. Delambre & Machain was assigned the office of ascertaining, by actual measurement, the exact length of this important unit, the metre ; and the ground chosen for the experiment was between Dunkirk and Barcelona, Delambre taking the northern part, Machain the southern. This great undertaking was projected just before the troubles of the revolution arose, and the seal and signature of the unfortunate Louis XVI. were appended to the instrument of appointment. The document, therefore, only invited persecution. The mathematicians were regarded by the country people with jealousy and suspicion. They were ill-lodged and worse treated. By some they were considered wizards, or lunatics ; by others, emissaries of Satan ; by all, enemies of mankind. Before their task was half executed they received intelligence from Paris that their names, and those of their associates, were struck off the commission by order of the ruling powers. But they took courage and proceeded on their own responsibility, trusting to the national sense of honor for reimbursement at some more favorable period. In this they were not disappointed.

But, although the tyrants at Paris abandoned the commissioners, they valued the object of their labors so highly that they lacked patience to allow time for its maturity. The Committee of Public Safety, acting under the influence of Robes-

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pierre, attempted to effect the contemplated changes by means of a standard, which was afterwards known as the *provisional metre.*

Shortly after the reign of terror had spent itself, the commission was reconfirmed, the names of the mathematicians restored, and they were allowed to proceed with their labors under government patronage. The whole of these important operations were conducted under the general superintendence of numerous commissioners, members of the Institute, together with commissioners from Spain, Italy, Holland and Switzerland.

One singular fact connected with the history of the decimal system is, that two of its earliest supporters seem to have been the very antipodes of each other—we refer to Louis XVI. and Robespierre. The latter had been a zealous patron of the object of our history from its earliest promulgation, but no sooner had he attained a preponderating influence in the Committee of Public Safety than, to the surprise of all, he deprived of their office Delambre and his party. This arose from his deadly animosity to the power from which that committee had received their appointment. He had also observed that the people were favorably impressed with the enterprise, rather from the praises they had heard from his party than from any clear conceptions of their own. Nor had it escaped his notice that the common denominations of weights, measures and coins were in many ways associated with objects of royalty. He, therefore, determined to break up the metrical committee, to divest the language of all names offensively royal, and, at the same time, to gratify the people by the speedy introduction of the decimal system. His first movement—namely, that of directing a death blow at the Royal Committee, as it was derisively termed, was explained by his publicly declaring that he did not intend to forfeit the advantages of the new system, which, he stated, might be much more expeditiously obtained without than with the assistance of the metrical committee. He knew, also, that with a people fond of novelty everything must be done in hot haste; and, since neither time nor money could be spared for geodetic operations, he decided upon hazarding

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another stake for popularity by taking a metre of his own devising.

The length of this precocious product of expediency was calculated from data furnished by Lacaille, who, in the year 1758, had computed a degree of the meridian in 45° latitude to comprise 57027 toises.

This took place at the commencement of the reign of terror, when Robespierre, Couthon, and St. Just held a kind of blood-stained triumvirate in the Committee of Public Safety, and used the other members chiefly as instruments to lend a sanction to their diabolical proceedings; and this committee, in their turn, governed the convention. There was, therefore, no difficulty in the introduction of a temporary metre until a more convenient period, when, as was promised, a correct one should be obtained by actual measurement. A decree to this effect was hastily prepared, but a part of its provisions were considered ineligible, until modified by a succeeding one; after which it was finally adopted, and became law on the 18th Germinal (March) A. D., 1794.

The metre, of course, was the grand unit of quantity, from which the units of weight and measure of capacity were to be derived. The nomenclature of this scheme differed from the one now used, by not admitting the denary multiples of the various units, but only the submultiples *deci* and *centi*. To supply these omissions, several denominations in each class of measures were used.

This project may literally be said to have been baptized with blood. The law which gave it a being was enacted at the commencement of the "Reign of Terror," but it cannot be said to have been placed in operation until after the conclusion of that horrible era. During that period the country was in a state of commotion that defies description. Nearly every province had its Robespierre, above the whole of whom Carrier, of water-marriage noteriety, held a distinguished pre-eminence as being the most extensive slaughterer of his race. The awful tragedies closed with the sudden removal of the principal actor and his associates from the stage of time, by the same machine which they had so liberally employed for the destruction of others.

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One of the most active, influential and zealous friends of the cause was La Reveillere Lepeaux, well known in France by the first part of his name, and abroad by the last. He was a zealous Girondist, and formed one of the party that suffered banishment on the ascendency of their political enemies, the "Mountain." After the execution of Robespierre, Lepeaux returned to Paris, and was permitted to resume his seat in the convention where he arranged himself on the side of the moderate party. Here he labored hard in advocating an improved decimal system. He soon procured a decree for its introduction, which, however, was not put into operation until he was advanced to a higher post of political power.

The provisional government gave place to one in whose creation they had been chiefly instrumental. This formed the third constitution, and was better known as the "executive directory." The leading power was vested in five directors, of whom Lepeaux was one. He seems to have owed his elevation to his fame for learning, and the prominent position he took in promoting the advancment of the new decimal plan; he was, also, one of the few survivors of the preceding massacre, who had taken a part in the condemnation of the late king. His character was a singular compound of philosophy, fanaticism, and infidelity; the chief powers of his mind were concentrated in an attempt to effect two objects: the establishment of a new decimal system, and a new system of religion. The latter he intended to found on the ruins of Christianity. This system seemed to unite two extremes; for while he ridiculed the Bible, he admitted, admired, and taught absurdities that would have sparkled in the pages of a jest book. His speeches were wafted across the English channel, and proved an acceptable condiment in the banquets of those who assembled nightly to read, and to hear read, the wisdom of Paine. Such was the man who figured as the leading promoter of the second decimal project in France.

The executive directory assumed their full powers in the autumn of 1795. Parisians had begun to respire, and trade and commerce to assume something like their former appearance when the new decimal plan was brought into operation. It was

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thought a fortunate circumstance that Lepeaux's exaltation took place at that critical juncture, but this coincidence seems to us rather problematical

Article 2 of the decree which received the sanction of the convention, and became law at the above named period, says, "There shall be but one standard of weights and measures. It shall be a rod of platina, on which the metre, the fundamental unit of the whole system of measures shall be traced."

Article 5 defines the metre. "Metre, the measure of length, equal to the 10,000,000th part of the arc of the terrestrial meridian, contained between the North Pole and the equator."

Lepeaux and his coadjutors also attempted to reform the calendar, giving 30 days each to the 12 months of the year, and altering the names of the months. The 5 days of excess were to be celebrated as holidays. The days of the months were to be divided into decades; every *10th day* was to be considered the Sabbath, in accordance with Lepeaux's "Theophilanthropy," and no other Sabbath was to be publicly sanctioned. The hours of the day and the minutes of the hour, together with all shorter periods of time, were to be arranged in a descending subdecuple series. Such was the law. Many parts of this absurd article of the decree have been subsequently repealed.

Lepeaux's admiration of the decimal system assumed the form of a mania that required all numeral objects to be considered in the order of *tens*. The day soon arrived for the introduction of the new system, but, alas for rulers, projectors, and people, the manner of *placing it in practical operation* had either been overlooked, or too faintly regarded. No public instructions had been issued that were available to the wants of the people. The early patrons of the new system had swept away all the old standards, and it was now seen, and felt too, that *no single term on the new scales found a corresponding quantity on the old tables*. Even the metre, described a quantity totally unintelligible to the people. They had supposed that this new system would, by a kind of magical process, convert confusion into order, and establish uniformity from one end of the nation to the other. But when the whole scheme, with its strange names undetermined quantities, and provokingly inconvenient magni-

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tudes was fairly placed before them, it was so widely different from everything they had looked for, that their extreme disappointment found vent in unmistakable sallies of indignation. The retailers and small purchasers felt the greatest degree of annoyance. They were unable to carry the law into effect, from sheer inability to calculate the required equivalents. Thus the buyer found himself at the mercy of the seller, and every trivial sale was attended with a sharp contest; respecting the rights of *meum* and *tuum*. Every purchase partook of the character of a speculation. This, combined with the confusion and perplexity produced by the oversight which we have named, was sufficient of itself to have ruined any project even if contrived with the genius of a Euclid. But there was something beyond this. The new quantities *when determined* were to be called by *new names*. The prefixes of the terms denoting multiplication were derived from the Greek, and those denoting division from Latin. But the French peasant knew nothing of Greek or Latin, and the whole plan was as unintelligible to him, as if the names had that day been imported from China. He was continually con founding *deci* with *deca*, *hecto* with *kilo*, and *myriagramme* with *millegramme*. Besides this he could never remember their *order*.

Another cause of complaint appeared, which, though not so perplexing as the former two, yet must surpass both in duration. We mean the *inconvenient magnitude* of the quantities proposed, in lieu of those they were designed to supersede. This blemish is not very conspicuous to the geueral observer, from being felt almost exclusively by those who are daily employed in manipulating weights and measures; but to them it now proves and ever will prove, a perpetual discomfort.

During the revolutionary storm, 300,000 keepers of retail stores were incarcerated, their property confiscated, and their prospects ruined. Trade and traffic were regarded as ignoble pursuits, while "the pride, pomp and circumstance of glorious war," were, with all classes on a worshipful eminence. But the small dealers were not the only persons embarrassed; every individual of the great public, that is, every buyer as well as every seller, was compelled to endure some portion of the

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general grievance. In a short time the general tide of metropolitan murmurs received a large accession from the rural districts, until its accumulated force threatened the very existence of the government. Barrass and his associates in power, at length aroused from their dreams of future prosperity, by the clamors of the populace, felt that they could no longer remain quiescent spectators of this grand working of events in Lepeaux's department. But what could they do? Some feeble attempts were made by means of public instructions, yet all such were found to be of no avail so long as the new denominations remained unaltered. The directors were in the position of children, who, having set a complicated and powerful piece of machinery in motion, were standing mute with wonder and affright from a conscious sense of their inability to stop its progress or control its motions.

Another cause of the unpopularity of the decimal system at that time, is found in the manner in which it was associated in the minds of the people, with Lepeaux's ridiculous "Theophilanthropy." Perhaps the most unfortunate event in the catalogue of mischances that attended the introduction of this reform, was that of making it subservient to the purpose of infidelity by abolishing the Christian Sabbath. This impious innovation originated with Robespierre, and not with Lepeaux, as it is generally supposed. He of the guillotine introduced the denary Sabbath into France, by appointing one day in ten, according to his system of divinity, for the religious consideration of some one of the virtues, as truth, justice, and the like, What fellowship he had with these virtues it is difficult to imagine.

However, this sacrilegious use of the system to perpetuate a continued breach of the decalogue, placed every Christian in direct antagonism to its advancement; and although the prevalence of infidelity in that age is a melancholy fact, yet the whole nation was not entirely submerged by that wide-sweeping whirlpool. Shortly after the excitement caused by the late cruel dynasty had subsided, we find 500 priests in Paris, and Lepeaux persecuting them in hot indignation for ridiculing his religious amusements. It is a notorious fact that this new

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calendar, with its decimal Sabbath, as it was called, fixed upon the decimal system a stigma that is scarcely yet removed. At that period every man whose religion was anything beyond nominal, felt himself bound to oppose it upon principle. An open attack had been made upon the religious feelings of the whole nation, and those who continued indifferent to the result must have felt condemned as traitors to their God, and not many degrees better than the Judas-like characters, who, in order to trade with the crescent, trampled upon the cross.

At this juncture the directory were informed that the commissioners first appointed to ascertain the length of the metre, were proceeding with their labors. This intelligence was at first received with astonishment, mingled with displeasure arising from a feeling of rivalry. The provisional metre was, on its introduction, publicly announced as being nothing more than a substitute for one that would, at some future period, be obtained by actual measurement. But, certainly, nothing was more foreign to the intention of all concerned in the directory than to connect themselves. in any way, with the "royal metre," as it was contemptuously called. Yet now, the directors, trembling for their places, and, probably, for their lives also, were glad to avail themselves of any expedient to divert the torrent of indignation which threatened to overwhelm them. Two out of the five had given place to others, but Lepeaux still held the reins of government, though with an unsteady hand. Talleyrand had recently joined their councils, and obtained their utmost confidence. He wisely recommended them to cast oil upon the tronbled waters by patronizing the metrical committee. To him this very committee owed its existence, and he had no connection with Robespierre's abortive attempt to effect its destruction. Accordingly Delambre's friends were courted, a new decree was issued in favor of his committee, and they were encouraged to proceed with their labors. It then became the fashion to sound forth the sterling merits of the legitimate metre; its presumed mathematical accuracy was applauded; the people were assured that the old names of quantity should be restored, and an entirely new system ar-

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ranged; and the scheme was entitled "a grand expression of national talent."

On their entry into Paris, the metrical committee were received with public expressions of courtesy and respect. Their report was presented on the 10th Prairial, A. D., 1798, and was received with unbounded applause. A new material metre and kilogramme were constructed on truly scientific principles, and presented with a pompous address to the two councils of the legislature; and these prototypes were ultimately deposited among the national archives, where they are still preserved with little less than religious veneration.

Borda was directed to ascertain, with scrupulous care, the exact length of the seconds' pendulum at Paris, for the purpose of establishing that of the metre, thus to facilitate its recovery in case of loss or accident. The absurd article of the previous decree, relative to the decimal division of time, was repealed, except the denary Sabbath, which Lepeaux still managed to preserve.

This committee also introduced the decimal division of the *quadrant*, but that achievement procured for them more compliments than sterling credit. The decimal system when applied to proper objects prevents perplexity, *but the circle is not of their number.* It is already provided with a mensuration suitable to its peculiar denary proportions, and one which admits of no improvement.

On 13th Brumaire, A. D., 1798, the legislature acknowledged the metre and kilogramme, recently presented, as the legal criterions of the measures of weight and capacity for the whole of France, to the exclusion of all others; at the same time admitting the names proposed by the earliest committee, but leaving the decimal divisions of the metre and its units undisturbed. The list of denominations now permitted, consisted partly of names in general use before the revolution, with a mixture of others known only in particular localities. The well known sounds of the old names awoke former associations, and seemed like the voices of old friends; but this drop of comfort was sadly embittered when it was discovered that these names were to be matched with the former decimal quantities. *Nor was*

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this new measure rendered more palatable from being concluded with a threat of compulsion.

After the novelty and excitement attending the introduction of the amended plan had subsided, its popularity ceased; and, in spite of the long tables of equations, and all other "appliances and means to boot," the calculations of value and quantity in the retail department of trade, still continued to be impracticable to many, perplexing to most, and odious to all. Instances of the people taking "French leave" to match the old names with the old quantities in their bargains, need excite no surprise when we reflect that it would be more likely for buyers and sellers to prefer to transact business by a system well understood by both, than by one that was intelligible to neither.

This third essay to introduce the decimal system was regarded by Lepeaux with feelings of displeasure, since it implied the superseding of his own well ordered nomenclature by another that was remarkably clumsy; yet he turned it to some account, since it furnished him with a pretext to prosecute those Christions that fell within the meshes of the law, and we bear record that he availed himself of this chance to the fullest extent of his power. He had formerly secured the attention of the multitude to his theological whimsicalities, through the imposing character of pompous exhibitions, seconded by his own oratory; but, these things having lost the lustre of novelty, were fast sinking in public esteem. He experienced another mortification from the decline of his popularity in the national councils. All these misfortunes he attributed to sacerdotal influence. At last, opposed by all parties and at all points, he threw up in disgust an office of considerable power, after having held it for nearly four years.

All parties were now sick of the decimal system; the legislature in making and repairing laws, and the people in observing those already enacted and the contagion continued to spread until it assumed the type of a confirmed epidemic. As to the project itself, notwithstanding the royalty of its origin, it was now in a pitiable condition. Clothed in the ragged garments of infidelity, deserted by its legislative protectors, opposed by the

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craft of the politician, the zeal of the priesthood and the thick-skulled fury of the ignorant, it still, nevertheless, struggled on, maintaining a dubious and somewhat occult existence, until the memorable period of the invasion of Russia by the armies of France.

The legislature of that day made a decree, granting the use of the ancient terminology in connection with the metrical standard units, on condition that the word *usuel* be added to each, whenever such names are expressed. Thus the *toise usuel* described two metres; the *livre usuel* equalled half a kilogramme, and so on for others. But the most striking article in this decree is that which directs that these units shall *not be divided decimally* but in *duodenary* order, that is, into halves, thirds, quarters and eighths.

This act of surrender on the part of the ruling powers, may be regarded as the total abandonment of the decimal principle, as far as they were concerned; we find that France had then gained little beyond the *metre*, and the experience resulting from a series of troubles, from the first day that Delambre's committee left Paris on their geodesical enterprise to the date of this decree, A. D. 1812, a space of time numbering just 21 years. How easy it is now to perceive that the Parisians might have obtained a suitable standard without the assistance of any committee. We mean their *toise*—a measure with which all Frenchman were acquainted. Besides, the act of taking the exact length of the pendulum for the purpose of preserving that of the metre, invests the rod of motion with the dignity of the ultimate criterion. Hence, the pendulum after all becomes the *principal standard.*

The sticklers for the decimal system, brought the decimal and the duodecimal scales into collision; for the new ounce and its divisions on the *usuel* scheme were so widely different from the *gramme* and its decuples, that the proportions could not be ascertained without a troublesome calculation. Perplexities and embarrassments pervaded the whole community. Artificers, in order to accommodate their various patrons, found it needful for the purposes of measurement, to be provided with a prism, having the divisions of the "*foot royal*" delineated on one side,

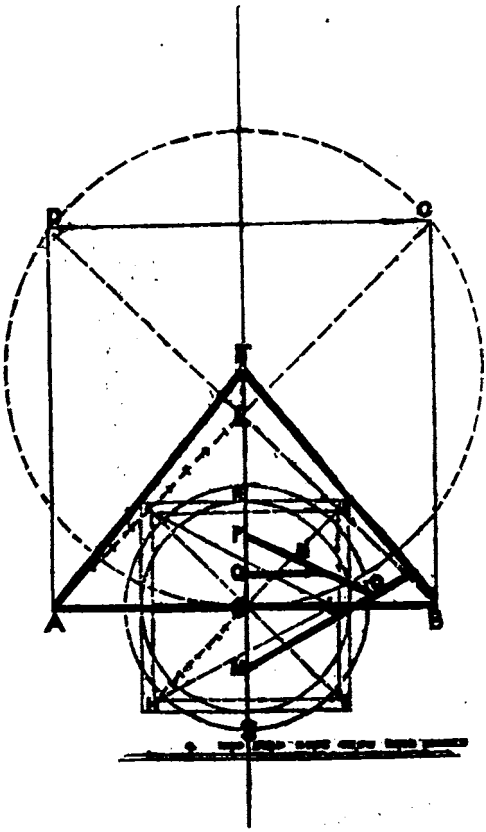
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the *centimetres* and *millimetres* of the decimal school on another and the quantities *usuel* on the third. These annoyances were not confined to the marts of commerce, they were also felt in pharmacy, for no dependence could be placed upon the manner of preparing medical prescriptions; and all things conspired to make it appear as if the confusion of Babel had met with a modern parallel; all confidence in "men and measures" having given up the ghost!

In order to still the tumult, the government, then under the dynasty of the Bourbons, interposed the weight of its influence with the view, it is believed, of entirely submerging the decimal principle as regards quantity. But this very movement seemed to call forth more friends to the cause which it was designed to crush, than it was ever supposed to have possessed. Whether this accession of support was due to political motives, or, whether it was instigated by the published animadversions on the decimal plan made by foreigners visiting France, it is hard to determine; but while it protracted the convulsed state of society, it aroused the system from that condition of suspended animation in which alone it could be said to have existed. The friends of the decimal principle availed themselves of these circumstances to strengthen their ranks, and exerted themselves right earnestly to secure quietude and convenience by the establishment of the complete decimal system of 1795. The spirit of the age was more favorable. The dealers were harassed with the vexations we have described, and a reaction was evidently produced, so the legislature, plied hard by the friends of the principle, took advantage of the popular movement, and passed the last decree in favor of the decimal system, A. D. 1837. This law made the original plan and the present nomenclature compulsory throughout the whole extent of France. after the first day of the year 1840. The space of nearly three years was allowed for the public to become acquainted with the names of the quantities and the demands of the decree, which it was understood would be rigorously enforced. This law has been observed. At first some reluctance was manifested by the lowest class, which caused the legislature a little trouble, but the people of France are at length in possession of their decimal, or metrical system after forty-five years of toil and disquietude.

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PYRAMIDAL FREEMASONRY.

BEING A SERIES OF ANNOTATIONS ON THE ORIGIN OR ARCHETYPE OF FREEMASONRY DISTINGUISHED AT THE BUILDING OF THE GREAT PYRAMID IN THE LAND OF EGYPT, 2170 YEARS BEFORE THE PRESENT DISPENSATION. READ BY THE SECRETARY BEFORE THE OFFICERS AND BRETHREN OF THE ST. AMBROSE LODGE, NO. 1891, HELD AT BARON'S COURT HOTEL, WEST KENSINGTON.

Before closing these essays I wish to add substantial proof, and endeavor to show what a grand delineation of magnitude and extension there is displayed, geometrically, in this Pyramid of Gizeh, in the land of Egypt. Our Masonic ceremony, speaking of geometry, says: "By it we may discover how the planets move in their different orbits, and mathematically demonstrate their various revolutions. By it we can, rationally, account for the return of seasons, and the beautiful and mixed variety of scenes which each season displays to the discerning eye. Numberless worlds are around us, all formed by the same Divine artist, which roll through this vast expanse, and are all conducted by the same unerring law of Nature. Then, while such objects engage our attention, how ought we to improve, and with what grand ideas ought such knowledge to fill our minds? A survey of nature, and an observation of her beautiful proportions, first induced man to study symmetry and order. This gave rise to societies, and birth of every useful art. The architect began to design, and the plans which he laid down having been improved by time and experience, have produced those stupendous works of art which have been the admiration of every age."

We may, therefore, consider geometry is the most important part in the original design, collectively with the cosmic relation of the universe, in framing this most noble pile of stone masonry we have been, theoretically, exploring on paper, without the fatiguing journeys to or from, and coping with sand drifts and other annoyances from the Arabs and their plunderings.

I intend by this diagram to show, by plain geometry, how this Pyramid was set out or planned by the Grand Geometrician of the Universe, by unerring lines; but those lines in true conformity with the vast ethereal expanse of worlds, and governed by the same geometric laws; lineal measure being also determined by these laws—the cubit of 25.025 and unit of 1 inch being the fixed standards. Colossal as our structure is, it is an atom only in space, yet situated and so built as to form a miniature world, proved by its mathematical correctness.

We will follow through the application of principles adopted in first laying down the plan of the building. We have advantages our ancient forefathers did not possess, except to very limited proportions. All knowledge was transmitted orally. or by illustration; not so now, for we have the advantages of printed matter, and other resources, to guide our pursuits in geodesic knowledge. The first operation being to lay level a hard rocky surface of fourteen or fifteen acres, and set out the four sides correctly with the cardinal points (any size would have answered according to the principle laid down), but there was design of great skill and ability to fix the base side lengths A, B, C, D, each side delineating the 365¼ days of the solar year; this correctly accomplished, a line was drawn from corner to corner diagonally each way, crossing each other at E, the sum of which in the fixed unit of inches denotes the slow precession of the equinoxes, 25,827 years. Then from the centre, E, divide one of the semi-diagonals, say from E to A, into ten equal parts, and take nine of these parts for the height of the Pyramid, F. (This $\frac{9}{10}$ of the

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half diagonal, or $\frac{8}{10}$ of the whole diagonal, of square base being the key, and the only key required to unravel all the slopes, inside and out, in a constructive point of view; in short, it solves the whole construction in its simple geometric details).

In the next place, describe a circle with F as a centre, the circumference of which will be equal to the four sides of the square base. A, B, C, D, with unerring exactness,—the outline of the Pyramid being thus duly formed at its proper angle, 51°,51′,14.8″. We shall see, as we proceed, how each part is based on the true principle of plain and practical geometry. Following on we will next proceed with the inside passages, continuing the same adaptability of lines and superficies; in this instance beginning with a circle in place of a square, dividing the height of the Pyramid into two equal parts, F, G.—describe a circle with this half height, having the point G on the base line for its centre. Divide into four the radius of this circle, to form the square whose four sides equal the circumference, and whose diagonal lines thus divided are parallel with the former diagonals of square base, and, crossing at G, divide one of these lines from the point G to H into nine equal parts, add one of these parts to each diagonal line outside of circle at H, I, J, K, and from each of these points draw straight lines forming the desired square. The two upper angles of this square at J, K, intersect with, and bisect the semi-diagonals of the base between A, E, and B, E, of the first formed square. This would again prove the correctness on which the geometrical problem rests, and also proves the mathematical precision of the Great Designer when constructing the work. But, to proceed; from the lower corner of this square at H, draw the hypothenuse from H to L, and also from the upper corner from K to L (dotted lines), thus forming the true angle of inclination or slope, 26°18′ of the ascending and descending passages. To determine the position of these passages according to this angle of inclination, for the descending passage, bisect the lower half of circle from G to S at M, and draw the line parallel with H, L, extending to the outer casing of Pyramid, from the central axis; to form, or determine the position of floor-line of first ascending passage and grand gallery, bisect the diagonal line from G to J at N, and parallel with K, L, draw the line P, O, from central axis at P, and intersecting on descending passage line at O, thus completing the true angle of inclination and position. Also, for lengths, for the passage way to queen's chamber; divide equally in t wo parts the height, between P and G, on vertical line at Q, from which point draw a line parallel with base of Pyramid, intersecting the ascending passage floor-line, truly correct in position on th at line, to form the requisite lengths of grand gallery, and the passage way to it, with marvellous exactness, when compared with our great measurer, Piazzi Smyth, in his work, 'Our Inheritance in the Great Pyramid.' This last completes the passages as far as we know.

Having these passages and angles correctly and geometrically set in position, I may add they define and lead up to a positive problem, only defined, as far as my limited observation has extended, in this our gigantic pile of masonry, and that at an age when, as some of our scientists would assert, few but barbarians existed. But to return to the poin t where we left off; on the central vertical line we divided the distance between P and G at Q; now, if we turn over the compasses to a third point, at R, we have Q, P, R; on this point R is the top line of the square of Piazzi Smyth's diagram, which square, in area, equals the area of the circle, having G for its centre, or the half height of the Pyramid; and if we describe a circle from the same centre, inside this last square (both the circle and square, in my diagram, are in red dotted lines), this circle will equal, in area, the square I obtain for the inclination or slope of the passages, and I think I may be bold enough to assert if these lines are truthfully drawn they will bear me out in my working of this problem, and I have yet to learn where the geometrical lines are to be found outside of the Pyramid and its mathematical proportions. Here we have the area of a circle equal to a given square, and the area of a square equal to a given circle, both worked out by square and compass, like other geometrical problems.

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My strong opinion is, that on this line R, where a direct double significance is attached, with a point in geometry, there will be found the locality of a double set of chambers, and the starting-point will be the ante-chamber on both sides. It is only repeating what is on the story below, if we may make use of so familiar a term to express so great a scheme of construction.

As many of my readers can and will try the application of these lines, and those having space, would adapt that space to draw it out on a large scale; and, furthermore, to prove the correctness of the result of their endeavors, I will, for the uninitiated, give directions so to form a scale of inches to any size square, so that the truth of the whole may be tested. As the base side length, taken from Piazzi Smyth, is 9131.05 P. I., divide one side of your square, or the base of the Pyramid, into nine equal parts, leaving a residual of $100\frac{31}{100}$, or what would make a little less than an $\frac{1}{3}$ of one of those 9ths, then each of these 9ths would represent 1000 inches, so that you would have nine of these 1000ths, which, together with the residual, would be 9131 inches; thus you may, on a straight line, dot off some five or six of these parts, and divide one into ten parts for 100ths; thus you have a scale, for all practical purposes as close as any scale can be for so vast a building; and, if the diagram be correctly squared, and the angles correctly formed, according to the diagram in connection with this paper, the results will be in close proximity to the illustrations of Piazzi Smyth.

Thus the whole of the passages are determined by plain and simple geometry, independent of its mathematical results and great astronomical delineations; it is one gigantic pile of wonderful construction, not of necessity requiring any given measure, or set of figures, after the first setting out of its basal plain. Geometrically, any size would produce the same angles and slopes; but it requires the starting figures of cosmic commensurability to produce the great equations and mathematical results set forth by Professor Piazzi Smyth's work, 'Our Inheritance in the Great Pyramid.' And, there is little doubt, as far as my comprehension of the practical theory of constructlon is concerned, that if a space could be found sufficiently large to set out the base of the Pyramid, to prove these lines, to a scale of a sixteenth its full size, or about 48 feet for the base length, requiring a room or floor of about 50 or 60 feet broad by 100 feet long—under such conditions it is very probable these lengths could be tested with some degree of certainty, and so establish this problem in geometry as fulfilling the facts and figures so far known. At the present time many arguments are alleged for the different discrepancies in actual measurement, and not a few are the opinions put forth to account for these discrepancies by very logical arguments—one by a gentleman, Dr. Wood, of the United States, who argues that the excessive rays from a vertical sun for some 4000 years has caused the whole structure to warp, more particularly the south side, being more exposed,—and I am inclined to endorse that opinion, from what has come under my own observation under a tropical sun. Some attribute the cracks and kind of fissures now discernible to volcanic disturbances, and some to a settlement, but the many ages it has been acted on by the sun is the most practical theory. Under all these circumstances, if my lines are not so minutely correct, the practical working with the positive geometrical following on of the lines, and the results attained and demonstrated, are very remarkable.

I believe there is much more yet to be developed in this grand and noble pile of scientific skill and ability. The discerning eye and the practical man can now see by its construction what was intended by the Great Architect to be removed without disfigurement, so that in after ages the same may be said and applied to the top end of the grand gallery as is now said of the bottom end; that is to say, at some time or other certain stones were removed which disclosed the queen's chamber and passage-way, and the almost perpendicular shaft once covered by the ramp stone; but doubtless the whole, both before its removal and since, had its significance and meaning; and I contend this geometric development places these other chambers in position.

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Now, brethren, to bring this vast matter of our ancient pedigree to a close, I would impress on you the dignity of our order, and proud, indeed, ought we to be as Freemasons to have the distinctive honor to be quoted as a fraternity emanating from so vast a seat of learning. Not, as I said in the outset of these annotations, would I detract one jot or tittle from the regal splendor of King Solomon's Temple, but rather add to its lustre by showing what wisdom and learning had preceded that historic time, and with the great wisdom with which King Solomon was endowed, and the resources at his command, those scattered elements of learning could be so collected, appropriated and concentrated on the Temple that nothing in this world could surpass it.

It is a grand pinnacle, my brethren, to exalt ourselves upon, and if those among us of a lethargic temperament can be induced to raise themselves to think more highly of the dignified status we have always held and been the custodians of, I again say, if I can actuate those of my brethren who think harshly of our ceremonies to investigate their precepts and teaching, and see the vast field we cultivate for wisdom and learning, then wil my hopes be realized and the object of these annotations or essays be gained, for verily the Grand Geometrician of the Universe has not brought us along in history, and preserved our traditions for so many ages, that we should be despised and set down as babblers and heretics. I maintain that Freemasonry has achieved some of the most gigantic, and raised some of the most stupendous edifices on the face of this earth, and by the guidance of our Divine Creator there is much yet to be accomplished to fulfil our "allotted task." Freemasonry is inseparably bound up with the volume of the Sacred Law ; on it our foundation rests, yet of itself Freemasonry is not a religion. It disseminates light like the sun, but while that great luminary lights but one half the globe at one and the same time, Masonry, with its effulgence, lights the entire universe and sends its rays of healing, consolation and good cheer, dispelling ignorance, superstition and error. To practice all the Masonic virtues would be attaining to a very high state of perfection, but it is not the regeneration of the heart by the Holy Spirit, nor does any of our ritual preach any such doctrine. "With the exception of Christianity, I know of no other institution in which benevolence so pure, and philanthropy so disinterested, are taught in obedience to the command of God ; nor where, but in the volume of the Sacred Law, the social and moral duties are enforced by such awful sanctions as in the Lodges of the Brotherhood !" Who can thoroughly understand the moral mysteries, as well as those of art and science, which our legends unfold, and who has so laudable and high ambition to participate in the exalted sphere, with congenial associates, in that subtle communion and fraternization which genuine 'Sublime Freemasonry' is peculiarly calculated to afford." So mote it be.

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GLIMPSES OF OUR CELTIC ANCESTORS BY EDWIN WILMSHURST RETFORT, NOTTS, ENGLAND.

INTRODUCTION.

As the following articles were written for publication in the *Banner of Israel*, a periodical advocating the theory that the British people are the ten tribes of the lost "House of Israel," it is necessary to explain that the writer has inferred that the Celtic tribes, whom the Romans found in possession of Britain, were descendants of Asiatic emigrants and of Hebrew descent.

Professor Rawlinson says that the Celts, who were the first people who arrived in Europe *from Asia, their birth-place*, pushed out the sons of Japheth, and, also, that a people known as Cimmerii, or Cimri, attained to power in Western Asia and Eastern Europe between B C 800-600.

From the "cities of the Medes," near the Caspian Sea (See II. Kings, xvii., 6), they migrated, and escaped over the Caucasus to the *Crimea*, thence to the *Cimmerian Land* of Herodotus, where now, in Wallachia the River Sereth runs into the Pruth. Pressed on by their kindred, the Scythian Sacai, the Cymry, or Cimmerii, migrated further to the *Cimbric* Chersonese (Jutland), from whence, always followed by the Saxons, they arrived in Britain, occupying the east and south coasts till the Romans, and afterwards the Saxons, pushed them to their present locations in Cumberland (*Cymry-land*) and *Cymria*, or Cambria, now Wales.

But the Sacæ, shown to be of the same ethnic stock as the Cimmerii, Cimri, or Cymry, also came into Europe *from Asia*, where they had seized the most fertile province of Media, called from them *Sakasina*. Strabo mentions the 8th, and Herodotus the 7th century B. C. as the period of the first appearance of these Scythic tribes, the ancestors of the British race; and the 8th century B. C. was just the time when the kingdom, or "House of Israel" (as apart from the *Jews*), were deported to the cities of the Medes. Herodotus states that Media was *not* the cradle of the race of the Sacæ.

Moreover, the Danes and Normans, who followed them to Britain, were of the same original stock as the Sacæ and the Cymry, and we are driven to the conclusion that the Cimmerii were a branch of the Sacæ, that the Sacæ were kinsmen of the Danes, Jutes and Normans, and that *all* came from the identical part of Asia (Media) to which the ten tribes were carried and scattered by their Assyrian conquerors, as recorded in Hebrew chronicles, in one of the latest of which, written just before the captivity, they are called (Amos, vii., 16) the "House of Isaac," whence Sakai-Suna, or Sons of Sakai—abreviated Saxons—"In *Isaac* shall thy seed be called."

PART I.

Before we approach the subject of the identity of the Britons with one fold of the lost sheep of the House of Israel, we must reject the popular delusion that the Cymry bore the same relation to the civilized Romans as the Australians. Maoris, or Red Indians, bear to the English. The nomadic tribes who came west across Europe from Asia were not aboriginal (Japhetic) savages, but rather enterprising backwoodsmen, rough and hardy pioneers, who, for various causes, had left the teeming lands of Western Asia.

If a far future generation discovers in North America steel-polled axes of the best Sheffield make, they will probably argue that the first wave of Europeans came there with the

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implements extant in their age; and the presence of implements of bronze (the production of civilized man) found in every part of Britain, and the fact that our ancestors used war chariots similar to those used by the civilized nations of Asia is an evidence that the British Celts, with whom the Romans came in contact, were survivals of colonies of civilized Asiatics of an age long antecedent to the Romans themselves.

The fact that Christianity was preached and received by them in the age of the Apostles shows that importance was attached to their conversion, and a passage from St. Paul's Second Epistle to Timothy calls attention to incidents interesting to Anglo-Israelites. "Eubulus greeteth thee, and Pudens and Linus and Claudia." Where now stands Chichester, the capital city, for the last 1,400 years, of South Saxons (Sussex) stood, in the first centuries of our era, the Celtic capital of the Regni (the opposite part of Britain to Gaul), which was, by Aulus Plautius, reduced into a Roman colony, and while a "colonia" of veterans was quartered there, the historian Tacitus records: "A few States were given to the British chief Cogidunus, whom I, even, remember, a faithful ally to the Romans." To the present day, the Roman rectangular camp, which may be traced in the present configuration of the city, exists within sight of the Celtic circular stronghold, which crowns the summit of the "Trundle," the highest elevation of the surrounding downs.

It was the policy of the Roman Emperors to adopt into their families, or "gens," distinguished chiefs of subject nations, and there is little doubt but that Claudius Cæsar gave his name and protection to the British king, henceforth "Tib. Claudius Cogidunus," the females of whose house would hence be all "Claudias."

The Roman family of Pudentinus was of the highest senatorial rank; and, in the army of Plautius, it is believed his son commanded a cohort stationed at Regnum (now Chichester.

About A. D. 67, the epigrams of the poet Martial were all the rage in Rome, and from them we extract the following:—

O, Rufus, my friend Pudens marries the foreigner Claudia;
O, Hymen, be propittious with thy nuptial torch.

Elegantly rendered by Professor Plumptre,—

Claudia, the fair one from a foreign shore,
Is with my Pudens bound in wedlock's band.

And in a later epigram, when children had blessed the union, the poet continues,—

Since Claudia Rufina has sprung from the azure Britons,
How comes she to have the feelings of a Latin maid?

What grace and beauty! With the daughters of Italy, she may pass as a Roman; with those of Greece, as an Athenian matron, etc., or,—

Our Claudia, named Rufina, sprung, we know,
From blue-eyed Britons; yet, behold, she vies,
In grace with all that Greece and Rome can show,
As born and bred beneath their glowing skies.

It is as likely that the high-born Pudens married a savage when he chose the British maid with auburn locks (Rufina) to be the mother of his future patrician descendants, as that an English officer on service at the antipodes would disgrace his family by marrying an aboriginal woman; and the fact that Claudia Rufina rivalled the beauties of Rome in grace and elegance, is an evidence of the racial superiority of our Celtic ancestors, and possibly of a Roman education.

In A. D. 1723, in excavating a cellar at the corner of St. Martin's Lane and North Street, Chichester, was found the dedication stone of the Roman temple of Neptune and Minerva, stating that the land for the temple was voluntarily given to the College of Roman Artificers by Pudens, son of Pudentinus, showing that, in close proximity to the Celtic town of Cogidunus, a Roman officer possessed land, and that Roman culture

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was strong enough then to induce a guild of artizans to come there to erect Roman buildings.

Dr. Stukeley, a savant of the period, believed the Pudens of the inscription to be the Prudens of the poet Martial, and husband of Claudia. the British maid ; and, considering the small grasp of the island then held by the Romans, it is extremely unlikely that there should have been two Pudens, who each married a Claudia, and each, moreover, with golden locks.

But can we connect this Pudens and Claudia with those mentioned in St. Paul's epistle? And how and when did Paul of Tarsus become acquainted with them? And, moreover, where did they receive the sacrament of Christian baptism? We believe we can answer these queries satisfactorily.

LETTERS.

LETTER FROM S. G. ARNOLD.

Washington, March 12, 1884.

Dear Sir: I notice, from Piazzi Smyth's article in the last STANDARD, that he commends, in no words of measured praise, the careful work of Mr. Petrie at the Great Pyramid. He says:

"The battery of scientific measuring instruments which he took out with him was more extensive than anything before known in that region, and had been in large part prepared for the occasion by his own hands with an acuteness and manual dexterity which cannot be too highly commended."

Mr. Petrie is a disbeliever in Mr. Smyth's theories, and the warm endorsement which his work has received from the Astronomer Royal is therefore the more noteworthy, and will give to his measurements a value in the eyes of the public which they would not otherwise have attained. As they are the latest and most accurate, and have been made with great care and labor and with the best of instruments, I was immensely interested to see what height he gave to the base side of the Pyramid, because none of the measures hitherto taken sustain the theoretic measures which were long since adopted by our Society.

According to Mr. Taylor's very careful investigations, the measures of the base side differ by about 70 feet. The most reliable may be re-stated in brief as follows: 693 feet, 728 feet, 746 feet, 763½ feet, 764 feet. Mr. Taylor explains these wide diversities by reminding the reader that the sides of the Pyramid incline inward and that the earlier measures were taken above the mountains of sand and debris which time has gathered around the building. The measures taken under the direction of Col. Howard Vyse in 1840, after the discovery of the casing stones and the corner sockets, are generally regarded as the most accurate and as approaching very nearly to the original model of the building.

But if there is disagreement in regard to the side of the base, there is no less disagreement in regard to the height. Indeed the height has been generally estimated from the base. The incline of the casing stones having been ascertained, the point at which the lines meet will be lower or higher, just in proportion to the size given to the base. Hence the height has been put at 478 feet, 480 feet, 490 feet, 486 feet, &c.

When it was discovered that the height of the Pyramid was intended to bear the same relation to the base as the radius of a circle bears to its circumference, the matter approached nearer to a solution but did not quite reach it. It could hardly be assumed that the proportions of this geometrical figure were accurately known at so early a period as

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the building of the Pyramid. As it was not known to the Greek mathematicians of Alexandria, we would not expect it to be known two thousand years before. Mr. Taylor supposed that while the building was projected on that idea, the proportions had not been accurately ascertained. Hence the height could not be accurately ascertained from the length of the base side unless their formula was the same as ours, or we knew the amount of errors in their calculations. If their formula was erroneous and ours is correct, clearly they would not give the same results.

But in due time it was discovered that the different parts of the building had curious correlations. Among these none is more remarkable than the apparent relation between the length of the ante-room floor and the circuit of the base, the height of the building, and the diameter of the circle on which the building is supposed to be projected. And if it can be shown that these several proportions accord with the actual known measurements, all the problems are solved. Hence the very great interest that I felt in these latest and most accurate measures of the great building.

Allow me to go a little into particulars. The floor of the ante-room is said to measure 116¼ inches, plus. It may be 116.26 inches—a very curious and significant number which appears to be the key to all external proportions of the building. If you multiply it by 50 it gives the theoretic height, if you multiply it by 100 it gives the diameter of the circle which is supposed to circumviron the base. If you multiply it by the formula in our arithmetics for deriving a circumference from a diameter, it gives the days, hours, minutes and seconds of our calendar year; and, by removing the point two places to the right or multiplying by 100, it gives the apparent circuit of the base. Such a combination of startling results could hardly be an accident, and hence our Society leaped at once to the conclusion that the results thus ascertained must certainly be those which the builder had in his mind when he "laid the measures thereof."

But there always has been a stern difficulty. All the actual measures were fatal to this theory. The earlier ones were altogether too small and the later and more accurate ones were too large. A theory that proves to be correct fits into all the circumstances and explains all the phenomena; but in this case the whole circuit of the base, as ascertained from the masonry line of the engineer, was some 16 feet or 192 inches too great, and we must either believe that it was incorrect or abandon our theory.

It is just this cloud that Mr. Petrie's measures have served to remove. As ascertained by his better instruments and more careful work, one side of the base measures 9126 inches which accords almost exactly with the theoretic measure, and clears away all doubts which have beset our problem. The theoretic measure is, in fact, greater by only 5 inches. Besides, if Mr. Petrie is correct, it goes far to prove that the builders of the Pyramid understood the true relation of a circumference to its diameter. If we multiply 116.26 inches (the length of the ante-room floor) by 50 it gives as the theoretic height of the Pyramid 5.813 inches or 484 feet 5 inches. If you take this height and derive from it the circumference of the base, you will find it to be 36.524 inches, or, for one side 9.131 inches. We get this result by our formula. But if the builders of the Pyramid did not use the same formula, how does it happen that their work corresponds so exactly with the latest and best and most accurate measures?

Again, if the builders did not use the same formula as ours, how does it happen that the theoretic measure expresses so exactly the length of our calendar year. If you multiply the length of the ante room floor (116.26 inches) by the formula now in use for obtaining the circumference of a circle, the result will be as follows:

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3.1415927
116.26

188495562
62831854
188496562
31415927
31415927

Days, 365.241567302
24

966269208
483134604

Hours, 5,797615248
60

Minutes, 47,856914880
60

Seconds, 51,414892800

	Days.	Hours.	Minutes.	Seconds.
Our calendar year,	365	5	48	46
Pyramid year,	365	5	47	51
Difference,				55 Seconds.

It will be observed that the figures which thus express the length of our calendar year also express the circuit of the Pyramid's base. But they require the removal of the point two places to the right. They are 36,524 inches, or, for one side of the base 9131 inches, being, as we have said, 5 inches more than the measure given by Mr. Petrie. The difference is just enough to show that there was no collusion, and the impression left on the mind of the thoughtful student is that the measures derived from the ante-room floor are those which the builder adopted, and that the little room in front of the king's chamber was so constructed as to record this key to the external measures of the great building.

S. G. ARNOLD.

LETTER FROM T. HOLLAND.

182 BROMPTON ROAD, S. W., April 15th, 1884.

Mr. President:—Yours of the 1st inst. just to hand, and I hasten to reply though I sent a diagram and slip, as per enclosed, a week ago, to Mr. Bisbee, thinking it probable the one sent to you was worthless *as it is considerably in error*, sending it away under some anxious haste to get it off my mind while shifting my residence. I think the diagram now enclosed is much more correct and produces many more facts geometrically, and of a practical character, mathematically I will not say. But, if my scale and compass principle produces a fixed height, and a circle struck from that height, the circumference of which is equal to four base side lengths, surely there is some ground for my conclusions, leaving the tests by trigonometry in more able hands. The other results from a following on of my lines seem to me remarkable, namely, the production of a circle equal in *area* to a given square, also a square equal in area to a given circle, and of different sizes, yet both required to complete the formation of the structure in a practical sense. I have a very high and distinguished respect both for Mr. Wood and Mr. Dow and their mathematical calculations, and it may be possible discrepancies may exist outside their gifted calculations—"Flinders Petrie" for instance. I will however leave the whole matter in your hands, and

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I am confident my humble efforts will not only be safe, but judicially applied if found worthy.

Yours most sincerely and respectfully,

THOS. HOLLAND.

I have made several of the enclosed diagrams to send here and there. They are on too small a scale for close testing, but answer the purpose to illustrate my meaning. I am sending to Piazzi Smyth, Mr. Biden, Mr. Homer, and others, before publishing.

T. H.

LETTER FROM REV. JAMES A. UPJOHN, IN REPLY TO MR. LATIMER'S INQUIRY AS TO HIS METHOD OF FINDING THE NUMERICAL VALUES OF SCRIPTURE NAMES.

Dear Sir: I began at the first word of the first verse of Genesis and counted the value of the first letter added it to the value of the second letter, and so on until I got beyond the cumulative number 888. If before that I found the cumulative number 666, I marked it. In some parts of the Bible I counted as far as 999, then I would begin as at first and count the first letter of the word next following the last word included in the first sum, and add to that first letter the value of the next, and so on until I had reached 888, or had found none there, and from that point I would start again counting as before. In this way I found many appearances of 888 and of 666. Of course when I saw an approximation or likelihood of the number I would examine more closely. I would always begin anew at each verse, when the verse preceding ended with a period. I do not think that many appearances were passed over, for I have frequently tried to find or pick out a 666 here and there and do not recollect finding any, in this way, which I have come across in the progress of my consecutive counting. There may be grammatical rules which would exclude some given *e. g.*, when the last word included in the 666 is in the construct state, having a termination different from its independent form. But these instances are comparatively few.

This 666 must be studied with a reference to Rev. xiii. 18. I think that the number as found on Pharaoh, Nebuchadnezzar and other Old Testament heathen kings gives us types of anti-Christian manifestations. A student of history could find the parallel between them and epochs and events which have occurred during the Christian era. But I believe that the number has a wider application: Thus its original reference is the *genus homo*, next, man in covenant with God, next, the powers in their relation to that man in covenant with God. The Bible concerns itself not with all men. It starts with Adam and Eve and gives us the names of three sons, Cain, Abel and Seth, but we must believe there were other sons as well as daughters. Then again it takes up Abraham and is occupied with the history of his descendants, and whatever accounts of other people came in are incidental as they are brought into relation with the Jews. I started with the intention of getting out a work on 888, which is a simple subject, but was turned off to 666, the reference, Rev. xiii. 18, leading me to believe that it would awaken more interest. There is a language in these numerally which can be used and understood universally. They are in language what uniformity in weights and measures would be if adopted by all people. I hope I have made clear some points, and if you find I can elucidate the matter at all, and have any difficulty to suggest, I shall be most happy to do what I can to remove the obscurity.

I thank yon very much for writing, and send you a prospectus of 888 which may throw additional light on the subject.

Faithfully yours,

J. A. UPJOHN.

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LETTER FROM REV. J. M. PERRY.

APRIL 12TH, 1884.

My Dear Sir: On receipt of your very welcome letter I immediately went over to Edinburgh to consult with Professor Piazzi Smyth, and on his recommendation I applied to a shipowning friend of mine in Liverpool with the object of getting my instruments taken out to Alexandria and back free of all charge; and I am now happy to inform you that I can get this done provided the members of the expedition take their passage from Liverpool in the same steamer that takes out the instruments. This will, of course, very materially reduce the cost, and I should think that £50 or £60 would cover the expense of packing, carriage to Liverpool, and carriage from Alexandria to Cairo or the Great Pyramid, and erection there, together with the cost of bringing them home. I shall be glad if you will kindly give me the earliest possible notice of the starting of the expedition, as I shall have to get a new stand made for the great equatorial, and many other preparations to make. I suppose we shall all start from Liverpool.

I heartily reciprocate your kind wish to meet me, and trust that the time may not be far off when we shall be associated together in the Egyptian expedition, as I presume you will form one of the party.

The Scottish Astronomer strongly recommends that no attempt be made to take the great telescope to the top of the Great Pyramid, but that it be erected near the base. In this I think he is right, for although it would not be impossible to get it to the top, yet the expense of doing so would be so considerable, and the difficulty and inconvenience of getting up and down the Pyramid for the necessary observations would be so great, that it would very materially restrict its use, while the advantage gained would be *nil*.

Of course the great telescope will at all times be at the service of members of the expedition for viewing and examining celestial objects, but the work which I should propose principally to devote the instrument to is the measurement of double stars south of the celestial equator. Some time ago I mentioned the idea of taking out my telescope to Athens or Egypt, with this object, to the first double star observer in the world, Mr. S. W. Burnham, an American astronomer, no doubt well known to you. He strongly approved of the suggestion. The following quotation from his letter will be interesting:

"With respect to Athens and Egypt I have, of course, no practical information or personal knowledge, so you will make due allowance in considering my notion about the matter. On general principles I should select Egypt, where I should expect to find, for a portion of the year at least, a dry atmosphere and a rainless interval. These conditions I have found to be very important with respect to good seeing. You doubtless know what I have said on this subject in my report on the Lick. Obs'y., and I have no doubt the statements there would hold good elsewhere. I should certainly select a place of that kind in preference to any other, after my experience in California. There is a further consideration which, other things being equal, would at once settle the question with me if I had any such trip in view, and that is the latitude. In Egypt, which is only about 30° north, you will have a splendid chance to work south, and further than any observatory in Europe or America can do. You will remember that at Mount Hamilton, in latitude 37° N., I could find new stars down to 45° S., or nearly that. With first class conditions you might expect to go to 50° S., one half of which will be almost new ground. Measures of stars there will of course be very valuable, for nothing practically has *ever* been done with the micrometer below 35°, and but little south of 20°. There is every reason for making the trip, if you can bring it about. I know of nothing that would be more interesting or profitable astronomically."

Of course, in writing this, Mr. Burnham knew nothing of the proposed expedition by the International Institute, nor did I when I received it, but his words show that useful

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and important astronomical results may be reasonably expected from the use of such a telescope as mine for a few months in Egypt.

With kind regards, I am, my dear sir,

Yours very sincerely,

JEVON J. M. PERRY.

EXTRACT OF A LETTER FROM C. PIAZZI SMYTH.

APRIL 26, 1884.

Its advocates began this work by saying that the metre was founded on the ten-millionth of the quadrant of God's created earth; but they are now beginning to reveal their real design from the beginning—viz., to throw the earth, if they could, overboard, and make the standard of the metre the metre-bar itself, as made by Frenchmen, and kept in a building in Paris for all men to come there and bow the knee to it.

Had it not been for that, all President Barnard's vaporings about the length of the earth's axis being absolutely unknown, and that it will always be so, were as prejudicial to the metre founded on 1-10 millionth of the quadrant, as to the sacred cubit founded on 1-10 millionth of the earth's semi-polar axis.

But he cherishes the idea of the human-made bar of metal in Paris being made to rule the world eventually, without any reference to either God or the world.

Yours truly,

C. PIAZZI SMYTH.

EXTRACT OF A LETTER FROM J. N. WING, NEW YORK.

JUNE 2nd, 1884.

I confess that the metric men (in scientific circles) hold sway here, and it will be a long pull and a strong pull to gain the lead. I, of course, talk with many literary men, and the amount of ignorance and indifference the majority exhibit is wonderful.

I do have some hope that Lieutenant Totten's book will arouse some interest on the subject of metrology.

And in regard to the Pyramid, I find many well read people on most subjects, ignorant as to the commonest facts of the history of that wonderful monument, besides a large number totally indifferent regarding it. I am not by any means discouraged, for experience has taught me that all great movements have been carried to successful issues by oftentimes a mere handful of earnest workers. We have here, at least, two able, earnest laborers, Lieutenant Totten and Mr. Clark; men who will yet be heard far and wide in this fight with the metric men.

Yours sincerely,

J. N. WING.

EXTRACT OF A LETTER FROM J. L. DAMPIER.

APRIL 17th, 1884.

Shall He find faith on the earth at His second coming? The absence and want of faith will then be one of the sure signs of the times. Then let us take due warning, for the air is thick with doubts regarding things unseen and the inspiration of the Bible; fables and myths are the terms applied to many of the events related in the Old Testament, such as our *first* parents, the building of the Tower of Babel, &c. It is contended now to be discovered that the continent of America was peopled with a wondrous race thousands of years before "In the Beginning," and the account of the "Let Us make man," which is nothing but a fable or myth handed down from this wonderful race existing so many

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many years before in "The Lost Atlantis," now re-discovered and brought to the light, to the light of man's understanding, so that he can see, touch and handle it, and therefore he believes, without the slightest doubt, forgetting that "Blessed are they who believe yet have not seen." They pretend to have discovered the origin of the whole heathen mythology, and that all the stories in the Old Testament are of the same class, naught but myths and fables—forgetting that all these ancient myths of Greece and Rome, in fact, throughout Europe and Asia, contain the Truth, but daubed over with untempered mortar, that true meaning and appearance has been obliterated and put to a wrong use. "The Serpent and the Cross" are worshipped—the created before the creator. The serpent and the cross may be traced in many of the figures and hieroglyphics of Central America. Part of the great continent they declare to have been inhabited thousands of years before Adam and Eve. All through India and China may be traced in their gods and temples, the "Serpent and the Cross," how and why is this? Because (as Dr. Seiss shows in his admirable work) God placed the same in the heavens "In the Beginning"—the twelve signs of the Zodiac, with their attending thirty-six Decans, instructing Adam in the same, thus handing down the future gospel, read in the stars above their heads, the Bible of the antedeluvians, understood by Noah and handed down by him, and still carried on to the building of the Tower of Babel, when we know confusion took place, and the people departed covering settlements as God led them, carrying with them the Truth, which in time became hidden, worshipping in these Zodiacal signs the created instead of the creator. Let anyone compare the myths and gods of the heathen with these signs, and the fact is apparent from whence these myths have their rise—viz., from the Truth delivered "In the Beginning," and not Christianity from these myths.

Yours truly,

J. L. DAMPIER.

EXTRACT OF A LETTER FROM MRS. H. E. GODFREY.

MAY 1st, 1884.

The other day I sought an introduction to a lady who has a friend living up in the mountains, almost to the eternal snow-line. For the last sixteen years he has been engaged in the study of the Bible. Six months of the year he is surrounded by deep snow. Living in his cabin all alone, he devotes this time to prayer and study, having no other books but the Bible. The result is something wonderful. How or why he was led to the study of the breast-plate of the High Priest I do not know.

Last winter he spent at Oakland, and directed an artist how to draw his charts, making them the exact measure of the described breast-plates. He arranges the names of the twelve tribes by the signs of the Zodiac, each sign corresponding to the tribe, the month and the stone upon which the name was engraved. In the peculiar way in which the tribes are placed, many things are shown which have never been discovered and all correspond to facts. He explains how the Urim and Thummin pointed, and, the lady said, many other things which she could not convey, because she did not understand.

He has lived alone so long that he is not able to express what he wishes to convey. He wants his thoughts written out for a book and would have been glad to have had his brother, Judge Haven, do this, but his law business interfered. He went before the Congregational Club of San Francisco, explained his charts, and while talking, men rose to to their feet interrupting him with objections; at the close, only one man expressed the opinion that there might be a great deal of truth in what he had shown, and for one he did not like to say there was none. I immagine, from what was told me, it was a bomb-shell among dry bones.

The little that was told me was so wonderful and glorious that I could not help thinking that if this information could be secured for the Institute, it might show a new way to

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study the Pyramid problems. If so, there would be great significance to the command, "Look unto the hills, from whence cometh thy help, thy help cometh from the Lord who made the heavens and the earth."

Surely if there is an inspired measure this breast-plate, which was worn by the High Priest when he entered in before the Lord, must be superior evidence, particularly if the metric system cannot be applied to its size.

Yours respectfully,

H. E. GODFREY.

EXTRACT OF A LETTER FROM LIEUTENANT C. A. L. TOTTEN.

JUNE 1st, 1884.

I have Barnard's third article. It is weak. You will get copies soon. It issues in book form this week, I believe It will do some harm, but not with those who read both sides of the question. He cites coincidence and gets up an imaginary Temple of Diana and a series of facts to match. I was waiting for the third article in hopes he would have some new facts to give and make some pointed arguments. But the whole matter is barren of interest to me, and his style mere denial and ridicule.

Yours truly,

C. A. L. TOTTEN.

EXTRACT OF A LETTER FROM JACOB M. CLARK, C. E.

Since I wrote you, I have seen Lieutenant Newburger of Elizabeth, N. J., a Hebrew gentleman, formerly an officer in the Prussian army, and afterwards in the American volunteers in the civil war, who has just returned from Europe. Before he went, I asked him to observe any facts he could, as to the usage of the *people* of the German States in adopting the French metric system.

He says that in ladies' dress goods, the French system is used. The reason is, that such goods are imported from France, and merchants and others simply follow the invoices as a matter of convenience. As to all goods manufactured in Germany, and as to other transactions among the people, they uniformly adhere to the "El" or "Elle," (the cubit of Ezekiel), and think of using nothing else, and this fact is very uniform throughout, except as to such matters of public record, &c., as are controlled by Government.

The last number of the Magazine was exceptionally good in all the articles. I was much interested in Redfield's, "The Altar and Pillar to Jehovah," and have read it again and again.

Sincerely and truly yours,

JACOB M. CLARK.

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TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

April 23, 1884.

Colonel M. B. Ewing, Cincinnati; Miss Wetherell, Nottingham, England, and P. W. Ward, Cleveland, were elected members at the meeting.

Mr. W. Le Cont Stevens, of Packer Collegiate Institution, writes:

Your journal impresses me as an attempt to unite two things that have no necessary connection.

1st. The preservation and simplification of units already in use.

2d. The reference of these units to the Great Pyramid, and the preservation of what Dr. Barnard has called the Pyramid Religion.

I find the names of such men as Hilgard, Rogers and Fleming, whose opinions I highly respect. While I have had no opportunity yet of finding out from these gentlemen what is the basis of their opposition to the metric system, I can readily imagine arguments, exclusively non-religious, that might have much weight with them, arguments quite independent of any assumed "earth commensurability" attaching to the standards now in use. The earth's polar radius is *deduced* from measurements in what Piazzi Smyth stigmatizes as mere outside rind, and any earth commensurability relating to the inch is as uncertain as that relating to the metre. That the metre is better than the yard as a standard I do not at all insist, but what we do need is definiteness, simplicity, decimal relations between initial and derived units, ready convertibility between those of length, volume, weight and value, without the slightest consideration for any imaginary inheritance in the Great Pyramid or anything else.

Pardon me for saying you have tied a heavy mill-stone about your neck in becoming sponsor for Piazzi Smyth. President Barnard's criticisms appear to be eminently sound. Professor Smyth's reputation as a man of cool scientific judgment, it seems to me, must be destroyed by his indulgence in such wild vagaries as I find throughout 'Our Inheritance in the Great Pyramid.'

Mr. Latimer in reply says:

You say our Magazine impresses you as an attempt to unite two things that have no necessary connection.

First—The preservation and simplification of units already in use.

Second—The reference of these units to the Great Pyramid and the preservation of what Mr. Barnard has called the "Pyramid Religion." If you have not observed from the reading of our Magazine the relation between the British units and those of the Great Pyramid, then you have read in vain. Most assuredly they are there, and moreover I have no doubt at all that we shall show more conclusively the earth commensurability of the British measures than has ever been proved for the French metre, which you know is not a ten-millionth part of the quadrant running through Paris as was intended, but that part of the quadrant passing through New York. There is an error of 1850 metres, probably.

As to Dr. Barnard's fling at Professor C. Piazzi Smyth and those who have followed him, in calling our work that of the "Pyramid Religion," it only shows the animus of every metric advocate that I have had anything to do with, as they always resort to ridicule to carry their point. I think that you will find that there is no uncertainty in regard to the commensurability of the inch with the earth's measure. I admit the ingenuity of the French system and the convertibility of its terms, but you could learn that as well with any measure you choose to use.

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In discussing the letters Dr. Redfield said we should not repudiate the term "Pyramid Religion." We do not hold any religion in distinction from the religion of the Bible, but in corroboration of it. Those who believe that the Pyramid was built by Divine inspiration should accept the terms "Pyramid Faith" and "Pyramid Religion." Mr. Latimer said, "we do not object to the term, but to the derisive manner in which it is employed. I cannot doubt the inspiration of the architect of the Pyramid."

Mr. H. H. Pain, of the *Stock Exchange*, England, writes: "I am involved in an attack on the metric system. Mr. J. B. Brown has expressed his intention of giving me my 'quietus' next month, so could you send me some condensed pamphlets on the merits of the Anglo-Saxon weights and measures in order that I may meet my opponent's arguments."

Mr. J. B. Brown is a member of the London Chamber of Commerce, and also of the Tariff Committee of the British Chamber of Commerce in Paris. He is a zealous advocate for the introduction of the French metric system into England. He says: "The decimal system would save thousands of pounds sterling to English trade. The system is genius itself, a bit of real human inspiration."

In reply Mr. Latimer read an extract from John H. Felton's "Argument for American Consistency in the Extension of the Decimal Scale of Weights and Measures in Harmony with the National Currency." Mr. Felton gives a succinct account of the confusion and distress which prevailed in France when the metric system was introduced.

Dr. Redfield said there were many objections to a system exclusively decimal. The division of the months of the year must be duodecimal, and for many purposes an octonary division is preferable.

Mrs. W. A. Plumtre, England, sent the names of a number of persons interested in objects of the International Institute. She also enclosed an extract from an English paper relative to the work of Flinders Petrie for the Egypt Exposition Society.

"The great mounds of San, which mark the position of the once famous city of Tanis (the Zoan of our Bible), have been selected by the Egyptian Exploration Fund as their field of work during this present season. The many friends and supports of the Egypt Exploration Fund have good cause to be grateful to the Egyptian government and particularly to His Highness the Khedive, for granting them the exclusive right of digging at this site on the shores of Lake Menzaleh, in the Delta. It is also owing largely to the hearty concurrence of Professor Maspero, keeper of the Boulak Museum, that Mr. Flinders Petrie, the newly appointed agent of the Society, is now actually beginning the work of exploration. M. Naville, whose efforts for the work last year were so successful, though unable personally to superintend the excavations, has promised to edit any inscriptions which may be discovered."

Samuel Beswick writes on the same subject. He says: "Mr. Petrie was sent by the advice of the Royal Society. The district is near the place where the first battle of Tel Kebir was fought against Arabi Pasha. It is perhaps the most extraordinary spot in all Egypt, but it is a city of the dead. It was once a magnificent capital, more splendid in some respects than the ancient Thebes. This historic spot has now a terribly bad reputation for fevers, rain and despicable weather. It will be well if Mr. Petrie survives the isolation he will have to endure in this unhealthy district. The proprietors of the Boulak Museum undertook to explore it and found a vast treasure of broken obelisks, sphinxes, shrines, columns, beautifully carved and covered with figures and statues of gods innumerable. Some of these have been transferred to the Boulak Museum, near Cairo."

Mr. Latimer read extracts from a letter by J. Ralston Skinner and illustrated it by blackboard diagrams, but the letter in full was reserved for another meeting. Letters from Jacob M. Clark and J. N. Wing gave accounts of the meetings of the New York Society.

Mr. William H. Searles writes: "A friend of mine here, an experienced engineer,

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spent two years in Mexico, where, of course, he had to adopt the metric system in all his work of railroad location and construction. He became heartily sick of that unit, finding it exceedingly inconvenient, both in horizontal and vertical measurements, and particularly in cubic quantities." Mr. Searles says: "The discussion of pyramid questions is rapidly spreading and taking in all classes of men. It is well that the subject finds opponents as well as friends, otherwise the development would not be healthy. We need have no fear of intelligent discussion of the whole question, as we desire to make no claims and to advance no doctrines which are not founded on truth.

Professor C. Piazzi Smyth also writes of the benefit we derive from opposition, and refers to the necessity for another Egyptian expedition.

John F. Shaw, of Toronto, Ontario, says: "I think that when the grand aims of the International Institute are more generally known, every thoughtful man in christendom will consider it an honor to become a member and thus assist in developing one of the most important movements of the age."

Letters were also read from Mrs. E. Jane Copeland, Bryantville, and Lewis Biden, Portsea, England.

A bronze medal of the centennial of the adoption of the great seal of the United States, was sent the Society by B. A. Mitchell, of Philadelphia.

May 7, 1884.

As Mr. Latimer was absent, Mr. A. M. Searles, Vice President, occupied the chair. Rev. L. C. Rodgers, Georgetown, Col.; William Ritchie, Sharon, Pa.; and George C. Mastic, Cleveland, O., were elected members.

Professor Alfred B. Taylor, of Philadelphia, wrote with reference to Mr. Holford's article in the *Tennessee Journal of Education* on "The Arithmetic of the Future." Mr. Taylor says: "Mr. Holford writes as though from the year 1976, the octonary arithmetic (with all its advantages) will be an accomplished fact. This is even earlier than I have prophesied for it [see my Reports on Weights and Measures, p. 91]. I there contemplate a *century* or *two* of obstruction and resistance but believe that what is truest, wisest, best, shall surely in the end secure its empire."

With reference to the "Metric Commission" in Washington, Jacob M. Clark says: "I have proposed to Totten to join him in a circular to be sent to as many as we know in Washington, with a view of effecting what we can. Will you and your friends West do something of the same kind?"

Referring to the proposed Egyptian expedition, Professor Edward R. Graham says: "If I could be of any service I would gladly accompany it without fee or reward. I cannot help feeling the 'granite leaf' has something important to reveal."

Edward Theodore Cooper, Omaha, Nebraska, writes on the same subject. He says: "I practiced as a surveyor for twenty years at the Cape of Good Hope under the British colonial government. The surveys as there conducted are trigonometrical, worked out from a measured base line. The system as there adopted would be the only one available in ascertaining the basal dimensions of the Great Pyramid. Professor Piazzi Smyth, on page thirty-nine of 'Our Inheritance,' is in error in his statement as to the expense to be incurred in the preliminary clearing of the ground from those obstructing rubbish heaps of broken stones. In a survey of the character now contemplated, little or no clearing of the ground beyond opening out or clearing the corner sockets would be necessary—a level piece of ground being found and cleared in the neighborhood whereon to measure a base line. I should willingly associate myself with any body of gentlemen whom your Society might organize for the purpose of fully carrying out the object you have in view."

Samuel Beswick, civil engineer, writes: "No effort should be spared to get up an American expedition at as early a date as possible. If the British leave Egypt anarchy will reign for a considerable time, and make it unsafe for any European or American to be there. The British exploration party are now at work on the east of Jordan; the Ger-

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mans in Egypt and Jerusalem; and Petrie was sent off in a hurry the very day on which his late work was published, showing that advantage is being taken of the present lull, lest another outbreak should destroy the chances for a year or two." Mr. Beswick suggests that the base of the Pyramid should be examined and measured by mining galleries or tunnels along the four sides; he thinks that this would be less expensive and quite as effective as the plan of clearing the entire face of its rubbish.

Lewis Biden, of Portsea, England, says: "I have been equally pleased with yourself at the friendly feeling manifested lately between the better portion of the British and American people. I believe we are yet to become very closely allied on both sides of the Atlantic. There has been far too great an inclination to cultivate association with the French, who are totally unlike the English, speaking races in character and thought."

W. T. Alan, Greenville, Pennsylvania, writes with reference to his experiments with snow crystals. He has sent an article on the subject to the Royal Philosophical Society of Great Britain.

Professor W. A. Rogers, of Cambridge, Massachusetts, says: "I am having some new bars made of speculum metal. I shall try one of them for you. I can put lines of 10,000 or 20,000 to the inch on it. The surface will have a beautiful block polish and will not tarnish. I shall soon send you both the yard and one half yard bars."

Other letters were received from Thomas Holland, London, England; Professor Asahel Abbott, Brooklyn, New York; Mrs. H. E. Godfrey, Grass Valley, California; J. L. Dampier, London, Ontario; B. A. Mitchell, Philadelphia; George Kellogg, New York; Miss Emily Damon, S. Hanson, Massachussetts; T. B. Mills, Las Vegas, New Mexico; Rev. E. P. Ingersoll, Rosevale, Kansas; and other members.

Lieutenant Totten sends three papers, "Notes of Pyramid Studies." The first, "Early tradition as to the object and builder of the Great Pyramid," show that books were written and traditions preserved from times prior to the deluge referring to the erection of an important document, which was intended to transmit valuable information down to a late posterity. These traditions come down to us from countries the most distinct and separate from each other, and through persons of almost all religions. Lieutenant Totten's other papers are "The Religious Theory" and "The Scientific Theory.

Lieutenant Totten's papers occasioned an animated discussion in which the principal speakers were Drs. Newcomer and Redfield and Mr. A. M. Searles. A paper was then read from Rev. Dr. Wild, Toronto, Ontario, after which the meeting adjourned for two weeks.

MAY 21st, 1884.

Rev. L. A. Lambert, Waterloo, New York; C. A. G. Lewis and N. Raymond Chappell, New London, Connecticut; F. N. Learned, of Pittsfield, Massachusetts; John Heard, of Strathroy, Ontario; and Henry Lowe, of Denver, Colorado, were elected members.

The President then gave an account of his western trip and spoke of the interest manifested by persons whom he met in the objects of the Institute, especially in the contemplated expedition to Egypt.

The subject of the "Metric Commission" at Washington was then discussed. A letter to Mr. Latimer from the Hon. B. P. Bland, Chairman of the Committee, was read. Mr. Bland says: "The Committee on Coinage, Weights and Measures have taken no final action upon the matter of the metric system and will hear you or other gentlemen upon the subject at such time as you may be pleased to present your views." Hon. O. D. Conger wrote on the same subject: "I have made inquiry of members of the Committee on Coinage, Weights and Measures and I learn that there is no probability of any legislation being reported at this session relative to the adoption of the French or other system. The Committee, however, meets on Wednesday of each week and a hearing can, no doubt, be readily arranged if you so desire."

A paper from Samuel Beswick, C. E., "The Standard Base of the Pyramids," was then

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read by the President and illustrated by blackboard diagrams. In the discussion that followed Mr. J. H. Dow spoke in eloquent terms of the value of W. F. Petrie's recent work at the Pyramid. He then read a paper on the Pyramid and British inches, which was received with applause, and are solution was passed that it should be published in the July number of the INTERNATIONAL STANDARD.

A letter from Mr. Beswick inclosed an extract relative to Mr. Petrie's present explorations among the ruins of Zoan :

"Apart altogether from the interest awakened by passing events in everything connected with Egypt, many will be specially pleased to learn that the ruins of Zoan, the chief city of the Egyptian Delta in ancient times, are about to be thoroughly examined by 'The Egypt Exploration Fund' Society. The excavations to be made are expected to yield a rich harvest in objects of Biblical and other historical interest. The lost histories of the Shepherd Kings, who are supposed to have ruled over Egypt for five hundred years, are generally understood to be buried under the mounds of Zoan. It is expected also that here there will be found documents bearing on the history of the Hebrews during the 450 years of their sojourn in the land of Pharaoh. In short, no site in Egypt, or indeed in the whole East, is known to be so rich in buried monuments as this. To carry out this exploration in a thorough and successful manner, from twenty to thirty thousand dollars will be necessary. Enough has already been subscribed to give the work a fair start, and accordingly excavations have already commenced under the superintendence of Mr. W. Flinders Petrie and of M. Naville, both well known as distinguished Egyptologists."

A paper from Professor Piazzi Smyth, "The Earth's Axis of Rotation," was a reply to a statement of President Barnard in the 'School of Mines Quarterly.' President Barnard says "the length of the Polar axis of the earth is a quantity which may with strict truth be pronounced to be up to this time absolutely unknown." At the close of his paper he refers to the reformation of the calendar and the disturbance caused at the time of Pope Gregory's alteration. By a singular coincidence a letter on this subject was received on the same date from Professor F. Hess.

After a general discussion upon this subject letters from other members were read.

The meeting adjourned for two weeks.

June 4th, 1884.

Miss Oviatt and J. H. Holway, Cleveland ; P. H. Stewart, Cookstown, Ontario ; and Professor A. B. Hyde, of Allegheny College, Meadville, were elected members.

A letter was read from Jacob M. Clark, which gave some useful information with respect to the use of the metric system in European countries. Mr. Clark enclosed an envelope recently received from a metric advocate, which bore the inscription, "The adoption of the metric system, now making rapid headway in this country, will bring us into harmony with more than a score of nations, save millions annually in computations and a year of the school life of every child."

In connection with this subject we give some extracts from "The Decimal System," a work written some years ago by John H. Felton. Mr. Felton gives a graphic account of the distress and confusion that prevailed for forty-five years in France, in consequence of the introduction of the metric system. With respect to the "International Association," he says: "The orderly character of the decimal system, since its complete establishment in A. D., 1840, attracted the attention of foreigners visiting France. This circumstance aroused the ambition of the French philosophers, and induced them to attempt the extension of the metric plan. Meetings were called at various times, and communications addressed to foreigners of distinction, soliciting their influence in favor of the project. Such was the state of affairs in the autumn of A. D., 1855, when the great national exhibition attracted a large influx of foreigners to Paris. The friends of the metre, availing themselves of this favorable opportunity, convened a general meeting and formed themselves into a regular society, comprising all the foreigners of distinction that could be prevailed

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upon to join them. The International Association aims at nothing less than the conversion of the whole world to the decimal system, through the medium of the metrical. The first is a good work and may be accomplished through the use of our present standards; but the establishment of the metrical system in all the nations of the earth is quite another thing. The *rod* of these wise men of France may become a serpent, but it will never swallow up all the standards in the world, after the manner of that of the great Jewish legislator. It has been suggested that the world would adopt the French scale of centimes and francs. We assume the boldness to state that as long as common sense presides at Washington, we shall never exchange our excellent scale of currency for any in the world. We now come to consider the metrical terminology abstractedly. All that we have said regarding its reception by the people of France will doubtless apply with equal force to the people of America. It would be a dangerous experiment. The length of the names, the novel and unusual sounds, the difficulty of recollecting their order and the time that must expire before they could be perfectly understood and correctly applied—all these objections and others not named would be found to render the whole catalogue as repulsive to our digestion as it was to that of the French. It is true they have survived the dose; but knowing their sufferings under its operation we prefer seeking a milder remedy for our commercial and social disorders. Besides our confidence, in the skill of their physicians has received a severe shock, from observing their serious errors, and the protracted sufferings of the patient under their hands. No, *messieurs*, we cannot take the metrical pill, although it is gilded with the attractive epithet of philosophical."

Valuable papers from Lieutenant Totten and J. H. Dow were read by the President. A paper from J. Ralston Skinner was held over for the next meeting. Letters were read from several members, and after a short discussion the meeting adjourned till June 18th.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD, FROM APRIL 14TH, 1884, TO JUNE 9TH.

April—Mrs. E. D. Kimball, Salem, Mass., $2.00; Rev. J. A. Upjohn, Neenah, Wis., $2.00; E. L. Wilson, Philadelphia, $2.00; S. A. Chaplin, Plymouth, Ind., $2.00; P. W. Ward, Cleveland, $2.00: Jas. F. Rhodes, Cleveland, $2.00; Ole Olsen, Elgin, Ill., $2.00;

May—Henry Lewis, Cleveland, $2.00; L. Breckenridge, Cleveland, $2.00; I. C. Brewer, Sandusky, O., $2.00; Dr. J. W. Redfield, Cleveland, $3.00; Cholmondeley Woodward, Barrie, Ont., $2.00; Wm. Ritchie, Sharon, Pa., $2.00; Thos. Wann, Cleveland, $2.00; B. Saunders, Cleveland, $2.00; Wm. Rundquist, Elgin, Ill., $2.00; Jos. Hugill, Akron, O., $2.00; C. A. G. Lewis, New London, Conn., $2.00; N. Raymond Chappell, New London, Conn., $2.00; John Heard, Strathroy, Ont., $2.00; Rev. L. A. Lambert, Waterloo, N. Y., $2.00; Public Library, Elgin, Ill., $2.00; J. M. Durkee, Pittsfield, Mass., $2.00; F. N. Learned, Pittsfield, Mass., $2.00; Thos. Irvine, $2.00; W. B. Chisholm, $2.00; Wm. Chisholm, $2.00; Capt. Frazee, $2.00; E. W. S. Neff, $2.00; F. Fitz, $2.00; C. H. Schoenhut, $2.00; P. M. Arthur, $2.00; J. W. Richardson, $2.00; J. F. Ryder, $2.00; G. F. Ely, $2.00; Dr. J. A. Stevens, $2.00; W. F. Beecher, $2.00; H. C. Ranney, $2.00; Clark I. Butts, $2.00; W. J. McKinnie, $2.00; J. F. Holloway, $2.00; W. U. Masters, $2.00; all of Cleveland. U. S. Patent Office, Washington, $3.70; A. S. C. Wurtele, C. E., Buffalo, $2.00.

June 9th—Henry Snyder, Pittsburgh, $2.00; A. A. Folsom, Boston, $2.00; Rev. Samuel Studdijohn, Trenton, N. J., $2.00; Rev. L. B. Hartman, Trenton, $2.00; F. G. Darlington, Pittsburgh, $2.00; W. L. Nicoll, New York, $2.00; Lewis Parker, Trenton, N. J., $2.00; Hon. H. S. Little, Trenton, N. J., $2.00; W. C. J. King, Barrie, Ont., $2.00; Geo. Kellogg, New York, $4.00; L. Biden, $7.79; Rev. E. P. Ingersoll, Rosevale, Kansas, $2.00; Mrs. W. A. Plumptre, $2.44; W. B. Chapman, $2.00; F. G. Williams, $2.00. S. J. Miller, $2.00; E. S. Page, $2.00; Thomas Reeve, $2.00; E. J. Leighton, $2.00; N. P. Bowles, $2.00; John Todd, $2.00; Dr. Newcomer, $2.00; Alexander Vance, $2.00; Dr. R. A. Vance, $2.00; N. B. Gray, $2.00.

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EDITORIAL NOTES.

As the historical portion of the article on "The Unveiling of Isis" was concluded in our last issue, the first part of the next series is postponed to our September number, in consequence of a press of matter.

Valuable papers from Lieutenant C. A. L. Totten, J. Ralston Skinner and Arthur S. C. Wurtele, C. E., arrived too late for this number of the Magazine. They will appear in the September number.

REVIEWS.

'NOTES ON PYRAMID STUDIES.' By Lieutenant C. A. L. Totten.

These notes are published as a series of articles in the *Hempstead Inquirer.* They contain much valuable information in a popular and interesting form. We have received nine articles, viz.: 1. Early Traditions as to the Object and Builder of the Great Pyramid. 2. Past and Present Literary Dignity of Subject. 3. The Leading Modern Theories on the Great Pyramid. 4. The Religious Theory. 5. The Scientific Theory. 6. The Geodesic Theory. 7. The Astrologic Theory. 8. Egypt, Gizeh, and the Pyramid's Orientation. 9. The Unique Geographical Position of the Pyramid—The Prime Meridian—Standard Cosmic Time. Complete sets of these papers can be obtained by applying to Lieutenant C. A. L. Totten, St. Paul's School, Garden City, L. I., N. Y.

THE RESTITUTION, issued weekly by the Christian Publishing Association, Plymouth, Indiana. Terms, two dollars per year, payable in advance.

The Restitution advocates the final "restitution of all things which God hath spoken by the mouth of all His holy prophets since the world began." As a means to this end, the establishment of the Kingdom of God on the earth, with the Christ as King of kings, the restoration of Israel, the literal resurrection of the dead, the immortalization of the righteous, and the final destruction of the wicked, eternal life only through Christ, and many other kindred truths.

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I. In the first division of 'The Coming Age: Its Nature and Proximity,' the nature of the coming age is fully discussed as to its physical, moral and political character. In establishing the proximity of that age, the prophecies of Isaiah, Jeremiah, Ezekiel, Daniel, Zechariah, Christ, Paul, Peter and John, in his Apocalypse, are fully examined. Their Hebrew and Greek originals are compared, and their testimony critically noted relative to its rapid approach. It forms a complete text book of those prophecies which relate to a future age.

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THE

INTERNATIONAL STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

SEPTEMBER, 1884

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FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

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ROBERT MENZIES,

The discoverer of Sacred Chronometric Metrology in the Great Pyramid: Born in Edinburgh, Scotland, November 1833. Died at Almenia, Spain, 1878.

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THE
INTERNATIONAL STANDARD

SEPTEMBER, 1884.

THE GREAT PYRAMID AN EMBLEM OF THE UNIVERSE.

Editor of THE INTERNATIONAL STANDARD—*Dear Sir:* When you mathematicians and physicists have reached the end of your tether you will find yourselves all securely moored alongside of the good ship that bears our apostles and prophets. There are more allusions to the Pyramid in the Scriptures than have been heretofore conceived. Whether the followers of Enoch reared it, either in anticipation of the period when the Pleiades should culminate at the same time that Alpha Draconis looked directly down the descending way, or in commemoration of a period much earlier, when the crossed urn of Aquarius Aristæs was on the meridian; or whether it was built under the direction of Joseph when he was Zaphnath-paaneah in Egypt, and in commemoration of the Pleiadic-Draconian period; one thing at least is clear. It was designed to be a figure of the universe; and as this could be completed only when God should become fully manifested in the incarnation of the supreme Son and his triumph over the rebellion of angels and men that sinned in paradise, so the pyramid would remain

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unfinished for ages, a true frustum, though lacking little of its proper heighth. It is to be noticed that while an opinion prevailed that the pyramids were found displeasing to God, yet in Egypt tombs were frustra of pyramids; in India the temples take qualified pyramid forms; and even in distant Astec land they were frustra of pyramids, like the Egyptian tombs—all evidently showing that the universe was not yet perfected in the appearance and works of the incarnate God. Hence both temples and tombs and perhaps altars were anciently left slightly truncated until the epiphany of the Mediator should be realized in the open and severe defeat of the enemies of God and man.

The pyramid form to temples and shrines was probably chosen as an emblem of the divine stability, and of these one of the most perfect seems to have been that by the Euphrates that lightnings melted to glassiness and earthquakes shattered to the foundation near the coming on of the deluge that the Greeks of Hellas have named from Ogyges or Deucalion, from Helios or Perseus or Herakles, and the Alexandrians from Dardanus; others from Chronos, or Neptune, or Oannes, a corruption of the Hebrew Noah; the Sisuthrus, or Saturnus of the Assyrians as it comes to us in the Greek romances. Similar to this Bab-El, that Moses writes Babel, the Synchysis, or Confusion of the Septuaginta, because not divinely authorized, and therefore iniquitous, or a transgression, (Isa xxiv, 20), we find another, ascended by steps, at Cholula, in Astec land, and it is affirmed that others exist in the southwest of our American continent. The natives found here by the first Europeans affirmed that *their* ancestors had never used this for the purposes of divine worship, because pyramids had been found displeasing to the gods; a fact probably inferred from the divine visitation of the pyramid by the Euphrates, that was also heretical because reared of brick (Isa lxiv, 3), and not of more enduring stone. Many of our churches have pyramids upon their summits, and indeed our steeples are pyramids; and these are sometimes adorned with flames, probably to denote the presence in the sanctuary beneath of the pentecostal Spirit to sanctify and to save. In India for an emblem of the divine

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stability they cut temples (sometimes whole groups of them) out of solid rock in a mountain side, and in that of Elephanta, near Bombay, there is, mounted upon pillars and the backs of elephants, at the entrance, a well-cut pyramid of granite 90 feet in perpendicular height.

As a pyramidal sanctuary is necessarily truncated for a place of sacrifice upon an altar, and perhaps of sacellae, or most holy places near it, so our Great Pyramid is found not yet pointed, but level at top, constituting it a true altar, without another or others with their sacellae, imposed still above; though this was rendered inaccessible from below by a smooth casing all the way down to the base, for the priest and the offering must descend upon this altar from heaven. Melchizedek rules in that Jerusalem which is from above, (Jerushalem shel me alat Kimchi) and comes down upon the mount of his glory to make an eternal expiation for them that are sanctified. Hence in Isaiah (xix, 19), we have a memorial pile (matsebah) that is also an altar (misbech) within the land, (bethok erets) and may signify, and commonly does mean, what is within a certain area and near its border; (aset gebulah) the very position of the Great Pyramid itself, that is within the land of Egypt and near its western verge, as well as not far from its northern extremity by the mouths of the Nile.

But as the Great Pyramid is an altar nothing can be more appropriate than that there should be within its sides below indications that the true basis of the altar itself is in eternal and unbending rectitude, while the ways that creatures will take may also be described by appropriate signs. Hence in its structure are indicated the measures of the solar system, for even Proctor will own that he has found in it the years of the equinoxial precession, though he is not willing to allow that it is indicated by the diagonals of the base.

As to the interior, so far as known, no one at all acquainted with symbology will doubt that we have both the downward tendencies of created things to their own impulses, and the upward tendencies of minds divinely touched; whereto correspond the material vehicles whereby minds make known their presence; for as the diamond is pure carbon so the spiritual body

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of Jesus is pure humanity cleared of its dregs and viler impulses, and as his has become, after passing through death, so shall be the bodies of his saints in the resurrection world. In Menu it is well said, "This terrible world is ever sinking down into ruin;" and the worshipers of Krishna Jaganath say that he burned off both hands in lifting up the earth when it was sinking down into hell, and so his misshapen idol of mystic emblems in Orissa has no hands. The downward way in the Pyramid, commencing at a certain elevation in the side toward the north, well represents the downward course of created things and of men, whether in masses or separate; for the course of the individual forms that of the crowd acting together in mass. Man's first condition is one of elevation; he is not a semi-brute just created upright in shape or developed from apes, though we will not dispute Darwin or any of his disciples who affirm that *they* are so developed, for it is not in nature impossible, though in times known to Natural History, every seed possesses its own body and hybrids never propagate. There is in Chaldee tradition the period of omroka, (markich) the expanse, the primitive chaos, when all kinds of strange forms were mixed to form men and other animals, and these brutigenae may have then had an ancestry quite as bruitish and as monstrous as they can desire. But the man that named animals on earth and the stars in heaven belongs to the historical race, and is our ancestor that received commission to treat apes and gorillas as his subjects and inferiors, and his natural elevation is well denoted by the elevation of the Pyramid entrance. But all history shows that man's course is downward, unless interrupted by divine influence; and so the first way in the pyramid leads downward to an unfinished chamber, with a possibility of continuing onward, none may say how far in utter darkness and in low places where there is no ascent.

But at a certain point another way springs upward, at first narrow; for the way of transgressors is not alone hard, though that of the just is hard only at the beginning, and it grows easier after we have proceeded a little way. This upward way leads toward an elevated place, where, upon the fiftieth course of masonry, opens the king's chamber, with its coffer, both

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modules of just measures and weights. Here then is the object of the just man's way upon earth; he aspires to perfect justice and truth, and through some tribulation he shall enter the chamber of righteousness where he shall see the King in the beauty of holiness and be defiled no more with the influences of sin. At the entrance of the expanded way—the grand gallery—upon the 25th course, a level way leads to what is called the queen's chamber This seems properly to relate to that class whose life is partly spent in non-progression, after they have begun to ascend toward the region of perfect rectitude. This class is unfortunately large in every age. They do not turn *back*, but *aside*, which for the time is little better; but they may at any moment return and ascend the upward way, though to their cost and delay and the loss of that crown of glory which the persevering and the diligent acquire. Immersed in the cares of business or study they neglect the uninterrupted pursuit after excellence which characterizes the truly wise who will attain to perfect sanctity and the true knowledge of what is supremely excellent of the Deity himself as revealed in his word and providence on earth.

Were there space it might be well to note how numbers are used in the inner ways and chambers of the Pyramid; as these, used artificially by the ancients, conveyed moral ideas and constituted a kind of stenography at once convenient and intelligible. In the queen's chamber 5 prevails; and it stands upon the 25th course of masonry: 25 being an intense form of law,—(52); they who choose that false rest, and care less to ascend with the progressive toward the heavenly and divine, being under fear of the law while they delay to ascend toward the just, the pure, the unearthly. In the ascending way and the king's chamber we find 7 (4+3) the Deity, a Trinal Unity, perfected by the incarnation for purposes of manifesting himself to the senses no less than the reason of the intelligent creation. Then there is 8, the sign of a renewed life, the resurrection, etc, with other numbers not necessary here to enumerate. To such as lack familiarity with numbers we commend the Palmoni and Mystic Numbers of Rev. Dr. Mahan, after Brown's Ordo Saeclorum; and after these the sections on

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Numbers in The Tripod, as published in the 'Heir of the World' for 1882–3.

They who neglect taking the upward way toward the king's chamber, and proceed far down the easier, but still confined, downward course, till they reach the verge of the chamber of sorrow—the unfinished opening below—find no way to return, because of the steepness, the closeness, and the crowd coming down; but to these another way opens backward, somewhat steeper than that by which they ascended, and with extreme hardship they may reach the chamber of penitence, where they are confronted with an almost perpendicular ascent, that none can hope to overcome without help from above; and at the summit of this passage there is the appearance of a rock covering recently torn away, leaving behind a simple fragment cemented into the mouth of the well-like opening; and here they that are lifted out will find themselves at the foot of the grand gallery in the upward course toward truth and right, and happy are they if they be not seduced by love of ease to turn aside toward the queen's chamber of unrest.

Such, in brief, to one familiar with ancient symbols, are the interior ways and chambers of this amazing structure. But what correspondences are in it to Messiah and the Incarnation as revealed in the Divine Word? This has been in part answered already when we have spoken of it as an altar upon which he—the true Phœnix—descends for the immolation of himself that the world below may be expiated and delivered from everlasting fear.* The completion of the Pyramid then would signify the triumphant close of the mediatorial enterprise on earth; and this is the view customarily taken of it in the Scriptures at large. To this the author of the 118th Psalm looks forward when he says, "The stone that the builders rejected is become the supreme pinnacle." (rosh pinnah.) The builders set it at naught, not because they did not know its intention, but because they did neither wish that it should nor believe that it could be laid; the hells had no faith in the doctrine of an incarnate God as Lord of the world; but he becomes so at the end, when they have done what

* Irrita perpetuâ solvent formidine terras. Virg. Eclogue iv, 14.

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they could to shew it impossible: it is a divine work, and a marvel to creatures. In that most mystic vaticination of Zechariah (iv, 7), where he is contrasting divine with human plans—true with false measures—it is said, "What art thou O, great mountain? Plane art thou to Zerubbabel; but he shall set up the supreme stone thereof with shoutings of Grace! Grace! before it." The pile is level at top, but Zerubbabel—he that brings order out of confusion (babel)—is to finish it, as he has built it from the foundation (v. 9), and then shall they know that he is sent of God for his work—"it is the Lord's doing, and it is marvellous in our eyes." Some of the less informed have seen in "the stone that the builders rejected" the stone of Bethel, that the Jews named the foundation pillar of the temple, although it was used in the holy place as a stand for the censer when not in use; but its name indicates the possession of it to be essential to the existence of a legitimate temple or sacred enclosure, as it had been an heirloom in possession of some leading family of Jacob's descendants, from his time to the reign of Solomon. That stone was one of the six things that were wanting in the second temple, and it has been ever maintained in the west that Jeremiah brought it, with other sacred things, to Ireland, in the time of Eochaid at that period Herimon or Head King of that island, who married Tamar, a daughter of Zedekiah that came in the train of the prophet from the east, and was crowned above that stone in Tara, to the disparagement of another stone formerly used as a part of the coronation seat. That stone of Tara was long after removed to Scotland, and then, centuries later, to England, where it can now be seen below the seat of the coronation chair in Westminster Abbey. It has the appearance of a stone partly fitted for building purposes, but left unfinished, and is now very much dilapidated and nearly broken in half.* From its being thus left unfinished and apparently thrown aside as unnecessary in the building of a wall, some have conceived the notion that this is the stone the Psalmist had in view; but this is shewn to

* Certain persons have said lately that this coronation stone is a piece of Scotch sandstone, and not like any stone known in Palestine. A skilful geologist, employed by Dean Stanley a few years since, could not determine to what class of stone it belongs; it is very old and dilapidated, badly fractured, with iron rings for handling.

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be most unlikely, for the stone of Jacob was named a foundation pillar, while that in Ps. cxviii. is the supreme corner, the summit of a pyramid, and a pyramid in itself as to shape. In Isaiah (xxviii, 16) it is said, "One shall lay in Sion a stone, a stone well proved, a precious corner stone, a founding securely established." This stone is a pinnacle (pinnah) or summit; and St. Peter's paraphase (I., ii, 6) is clearer still if possible, while he condenses and shortens the text, "Behold I lay in Sion a supreme corner stone (lithon akrogonaion) * * * he that believeth in him shall not be confounded." This is the pinnacle of a prophecy in Zechariah (x : 4), and St. Paul refers to the same when he says, "We are built upon the founding of the apostles and prophets, Jesus Christ himself being the supreme corner, whereby the whole building fitly compacted together is become a holy temple for the Lord." So again in St. Peter (I., ii, 7): "The stone that the builders disallowed, the same is made the head of the corner"—*i. e.*, the supreme summit, as "the forest of his Carmel" for Carmel the fruitful, abounding with trees; "the body of this death" for this dead body.

There are other references to the same idea we have found in Ps. cxviii. But by putting our conception of a corner stone as one in the foundation of a building for this constant summit stone of Hebrew usage, we have lost sight of the true sense of our apostles and prophets who had ever in view the completion of a pyramidal temple that cannot be ascended from below; and when, by one offering, are perfected all that be sanctified it shall be used no more for offerings, but it shall be built up into a corner so sharp that no bird can rest upon it forever.

There are other but less distinct references to this pile in our Scriptures. As among the Greeks a temple or place of oracles was at times a petra or stone,* so, in Hebrew, counsel (as strength and might, Prov. xl, 14: xxiv, 6) is a stone for duration and power of resistance. Messiah is "the stone—the Great Counsellor—of Israel"; (Gen. xlix, 24); and "the princes of Judah" among the apostles (Ps. lxviii, 27: 28) are "their stone" or counsel, and this, for an emblem of strength, must have been

* Bryant I, p. 283.

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pyramidal in form: a pyramid, in each case, is in the author's mind.

Thus the idea that the Great Pyramid is a figure of the universe to be completed in the advent and works of the divine incarnation is fully sustained, and is the only idea of it possible to an adept in oriental studies. Well has it been classed among the seven wonders, and its proposed completion is rightly named a marvel and wonder, the great wonder of time, divine, and not a human work. Hence, in Zechariah (iii, 8), Zerubbabel and his mates are "men wondered at"; they personate Him, and their work is his, whose name is "Wonderful, Counsellor, the Mighty God, the Everlasting Father, the Prince of peace."

To preserve this immense pile for use in these last days of severe trial to faith, and to secure its contents from the violence of 4,000 years of war that were to come upon the earth, the entrance to our pyramid was concealed and its upward way blocked with loose-lying rocks. These were removed, after forcing a way below, by the Saracens, and the way to the king's chamber laid open for future explorers; and now it stands revealed as a central depository of correct measures to an age that can use them and needs them, and a people that can protect them from the ravage of future Vandals. Hebrew England now holds and must continue to hold Egypt for purposes more divine than human; let England guard this relic of far off ages when "science" was real as one of her choicest spoils won in her progress to an empire as extensive as the globe itself; and this shall be her glory and her joy

ASAHEL ABBOTT.

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THE ALTAR AND PILLAR TO JEHOVAH.

VI.

For the sake of preserving a clear and comprehensive view of our subject in its general proportions, let me here remind my readers of the five parts into which it is naturally divided—1st, The Altar to Jehovah; 2nd, The Midst of the Land of Egypt; 3rd, The Pillar at the Border Thereof; 4th, The Purpose and Significance; 5th, The Being to Whom Dedicated. These parts being mutually dependent upon each other, so that neither one can be treated particularly without general allusions to the others, I ought to have stated at the outset (and perhaps would have done so but for fear of shocking seemingly established prejudices beyond endurance) what I thought might be given me to show under each division, namely: under the first, that the Great Pyramid is like what the altars to Jehovah were in the land of Canaan; under the second, that "the midst of the land of Egypt" is identical in place with what was once "the midst of the garden" of Eden; under the third, that the Hebrew word translated "a pillar" ought to be translated "an image," as it is in several other passages, and here means the Great Sphinx; under the fourth, that the relation of the Great Pyramid to the Great Sphinx represents that of the earth to Leo, Virgo and Libra, and to the other signs of the Zodiac, as to a dial of the sacred chronology of the precessional cycle, in which it may be shown chronologically, as well as circumstantially, that the author of these two cotemporary monuments was Joseph, who substituted them for the tree of life and the tree of the knowledge of good and evil, to commemorate the brief sojourn of the church and the kingdom of the heavens in the Paradise on earth, and to prophesy their return to abide forever. Finally, I should have said that, under the fifth division of our subject, it might be given me to show that "Jehovah of Hosts," to whom the Altar and Pillar are "for a sign and for a witness in the land of Egypt," is THE SELF-EXISTENT

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BEING; *essentially* the Divine Love and Wisdom; and *efficiently*, as the means to the end of their self-existence, the Universe of created existences, microcosmically represented in their one only perfect image and likeness, "their well-beloved and only-begotten Son," who, as the one only possible incarnation of "the fullness of the Godhead," constitutes the one only comprehensible Divine Trinity of the Father, Son and Holy Spirit, "from whom, through whom, and to whom are all things."

Of most of these propositions, if not of all, I may say to the majority of the readers of the INTERNATIONAL STANDARD, "Ye cannot bear them now;" but I trust you will bear with my endeavor to reduce them to the promised demonstration, until, in one or other of the two possible ways, "forbearance ceases to be a virtue."

I have still a good deal to say under the first division of my suject—the Altar to Jehovah. As a more scientific expression of the means by which the Great Altar of Sacrifice was converted into the Great Altar of Witness, I may say that the Great Pyramid was originally a treasury-stronghold, or mastaba, of the ordinary mastaba-angle of about 76°, and was converted into a monumental tomb, or pyramid proper, of the ordinary pyramid-angle of about 52° (or, more definitely, of its own exact π proportion, in which the angle is said to be 51°, 51′, 14,″) by such a superposition of masonry as was necessary to that purpose. If this statement be true, it is susceptible of demonstration. The supposition that a mastaba, in distinction from a pyramid, was a treasury-stronghold, in distinction from a monumental tomb, is supported by the following from 'Our Inheritance in the Great Pyramid:' "Besides the many early local traditions—which can hardly but have *some* foundation—of treasure having been deposited in the Egyptian Pyramids by kings who lived close after the flood, Colonel Howard Vyse and Mr. Perring (on pp. 45, 46, of the former's 3d vol. of 'Pyramids in Gizeh'), gave an account of a chamber in the great, terraced, and rather oblong Pyramid of Saccara, closed in the ceiling by a granite stopper, of the shape of what is employed in a 'stoppered' glass bottle of the present day, but of four tons' weight; and that peculiar chamber was confidently de-

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clared by those authors to have been 'a treasury,' 'a secure and secret treasury,' and one that had certainly 'never been put to tombic use."—(Chap. xviii, p. 409). This is a fair introduction to my idea that the Great Pyramid includes a great mastaba. If this supposition be correct, it constitutes a legitimate ground for inquiring whether it be not the true explanation of the dual description—"an altar to Jehovah in the midst of the land of Egypt, and a pillar at the border thereof to Jehovah, for a sign and for a witness to Jehovah of hosts in the land of Egypt." Not "a pillar," but "an image," (the true translation) may refer to "the Ancient of Days," which Mr. J. Ralston Skinner says means the Great Pyramid (see STANDARD, vol. ii, p. 188); or it may refer to the "one like unto the Son of Man," the description of which, in the Revelation, is very like that of the Ancient of Days in Daniel. But the question of this application of our text cannot be answered in the affirmative until the supposed duality of the Great Pyramid is proved a reality beyond the shadow of a doubt, and in this series cannot be properly discussed till we come to the 3rd division of our subject, *The Pillar at the Border Thereof.* Whether the Great Pyramid be dual or not, I am thoroughly satisfied that the "altar" and the "pillar" are not one and the same, but are one and inseparable, either by combination or by harmonic relation to each other, the one "for a sign," and the other "for a witness," memorial or monument to Jehovah, through all generations.

Now, if the Great Pyramid be of the two-fold character which I have ascribed to it, the fact must be discoverable in the structure itself. The gables of the king's and queen's chambers appear to be of the mastaba-angle, showing that these chambers belonged originally to a great mastaba. Moreover, the arch-mason did not cover up his great mastaba with his more distinctive pyramid-masonry without indicating the latter in distinction from the former by the pyramid-angle of the anticlinal stones over the doorway of the Great Pyramid, presenting the grandest gable of all, to be revealed at the right time by that necessary, though criminal desecration, the removal of the beautiful casing-stones. Still another indication of the concealed

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mastaba, and this a direct one, may possibly be found in the entrance passage, not far from the imposing entrance. The mastaba-angle, theoretically traced from the northern base line of the Pyramid, may be found to cross the descending passage at the junction of the great notched wall-stone with the double course of wall-stones, on a line parallel with the sloping roofs of the chambers on their north side, and not extravagantly far from parallel with the line of the ascending passage and grand gallery. Should it be found to do so, it may be worth while to remove the outer stones of the Pyramid to the depth indicated, to discover evidences of the mastaba-surface, carefully marking the stones in their removal, and as carefully replacing them, with a view to restoring the venerable pile, in the good time coming, to its pristine beauty and perfection.

When the great mastaba shall have been thus discovered, confirming what I have said of the traditional recognition of the Great Pyramid under the name of the Great Tower, it may be thought worth while to remove the stones of the Pyramid, within a circumscribed area, down to the terminus of the northern and lower of the two air-channels of the queen's chamber, for the purpose of confirming the common-sense idea that these channels were for ventilation, to make the chamber inhabitable by the "queen," or by whoever else may have had occasion to take refuge therein in the straitness of a siege. We may then conclude also that the air-channels of the king's chamber originally terminated at the mastaba-surface, but that when the mortal remains of the man whom the king made treasurer and ruler over all the land of Egypt were laid in the granite sarcophagus in the king's chamber, the air-channels of this chamber were extended with the superimposed masonry to the surface of the finished Pyramid to allow an escape of the mephitic gasses engendered by the decomposition. Believing that the air-channels of the queen's chamber were for ventilation, so long as this chamber was serviceable as a place of refuge, I must believe also that the comparatively thin wall-stones of this chamber, by which the inward extremities of the channels were closed for the chamber's exclusive devotion to treasures sacred to the immortal dead, and by which they con-

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tinued closed until their discovery by Mr. Waynman Dixon in 1872, were introduced simultaneously with the superposition of the masonry by which the outward extremities of the air-channels were closed. By the internal and external stoppage of its air-channels, the queen's chamber was converted into a symbolic representation of "the house of Judah," the goats of the flock of the Good Shepherd, who has said of them that they "closed their ears, that they might not hear"; and by the extension of its air-channels to the outer surface of the Great Tomb, the king's chamber was converted into a symbolic representation of "the house of Israel," sometimes called "the house of Joseph," the people of whom the Good Shepherd has said, "My sheep hear my voice," and to whom He has so often addressed the distinguishing words, "He that hath ears to hear, let him hear." The fact of the dead body in the granite sarcophagus will appear no objection to this significance of the king's chamber, when we remember the words of our Lord, "The hour cometh, and now is, when the dead shall hear the voice of the Son of God, and they that hear shall live." The relation of this to the revival of "the dry bones of the house of Israel," before spoken of in connection with the transfer of the bones of Joseph from the "coffin in Egypt" to his "parcel of ground" in the midst of the dry bones of the slain in the valley of Shechem, is too obivous to need explanation.

According to the above speculations on the duality of the Great Pyramid, which I hope may be confirmed by the observations I have suggested, the builder of the Great Treasury-Stronghold was not the builder of the whole of the Great Pyramid, but must have left the design of the monumental part to be executed by Cephren, who survived him about 50 years. It is possible, indeed, that on the death of Cheops the prime minister of Cheops and Cephren executed his monumental design in honor of the royal dead, but in view of the evidence that Cheops was interred elsewhere, it is not probable that he did so. Of the actual fact of such a superimposed structure, and of a different hand in the execution of its design, there appears some evidence even in its orientation as compared with that of the ucture so imposed upon. After showing that the primary

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orientation was effected by means of the north star and the descending passage, Petrie says: "Considering, then, that the Great Pyramid core agrees with the passages far closer than does the casing, the inference seems to be that the casing was fixed by a re-determination of N. by the men who finished the building. These men had not the facilities of the earlier workers, and are shown by the inferiority of the later work in the Great Pyramid, to have been far less careful." ('Pyramids and Temples of Gizeh,' p. 126). If by "the Great Pyramid core" were here meant the part of the masonry extending outward from the "passages" to the mastaba-surface, and if by "the casing" were meant the part of the masonry extending inward from the Pyramid-surface to the mastaba, I could understand such a considerable difference between the orientation of the one and that of the other, the substantial core and the imposing shell having been constructed about 80 years apart, the one under the superintendence of the architect, the other only under the direction of his architectural design. To speak plainly, I think Jacob foresaw the great symbol of the Mediator between God and man only as Joseph was destined to leave it, a Step-Pyramid, with "the angels of God ascending and descending" its battlemented sides, representing the inductive and deductive movements of the Divine Love and Wisdom in the development and evolution of all things to and from the great First and Final Cause.

In a preceding article (No. IV) I accounted for the exceeding multiplication of pyramids in Egypt on the principle that the conversion of a Pharaoh's treasury-stronghold into his monumental tomb, on the occasion of his death, necessitated the building of another for the treasury and defensive purposes of his successor. In this I think I was right, but slightly mistaken in saying that "in this way the multiplication of pyramids only ceased with the complete subjection of Egypt to her foreign invaders." There was this other limit to the possibility of additional pyramids—namely, the limited area of Egypt's dominion on the west bank of the Nile, as well as on the east. Near approach to the southernmost boundary of western Egypt, irrespective of the alternating Memphian and Theban dynasties,

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compelled the reconversion of monumental tombs into treasury-strongholds, and the reconversion of these into those, by the alternate imposition of the one form of structure upon the other, causing successive enlargements with the alternating proportions of the pyramid proper and those of the mastaba. Evidences of this dernier resort of military necessity are seen in "the sixth dynasty pyramids of Sakkara," which Petrie says are of a much lower grade of ascent than the fourth dynasty pyramids of Gizeh, those being mastabas, and these pyramids proper. Of the so-called pyramids of Sakkara and Medum he says: "Both these mastaba-pyramids are also peculiar in having been repeatedly enlarged. In no case have successive enlargements been found in a true pyramid; but both these structures have been several times finished, each time with a close-jointed, polished casing of the finest white limestone; and then, after each completion, it has been again enlarged by another coat of rough masonry, and another fine casing outside of the former casing. This explains how readily the Medum pyramid was stripped into a towering form; there were the older finished casings inside it; as soon as the later coats were stripped off, the older surface was revealed again." ('Pyramids and Temples of Gizeh,' p. 148).

Now, in my estimation, this remarkable fact of the successive covering of a mastaba by a pyramid, and of a pyramid by a mastaba, in the case of the so-called step-pyramids of Sakkara and Medum, adds not a little to the reasonableness of believing that each of the three Great Pyramids of Gizeh includes a mastaba, the altar stairs of whose four sides were once builded upon in a manner suited to a military defence of the treasures within. On this theory, the vast height between the king's chamber and the apex of the Great Pyramid *par distinction* is easily understood without the necessity of supposing an undiscovered chamber in the midst. It is to be looked upon as purely monumental, and to this end microcosmic and macrocosmic in the highest possible degree in its grand superposition of masonry, Heaven's most significant means of converting the Great Tower into the Great Tomb, or the Great Altar of Sacrifice into the Great Altar of Witness, a memorial forever of the

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life-long self-sacrifice, by which the architect became the most perfect type of the incarnate Jehovah and Saviour of mankind that the world has ever known. And supposing the architect to have inscribed this Great Memorial Altar with the name of the Being to whom he consecrated it, we see the best of reasons for this name having been revealed to Moses in the remarkable language in the third chapter of Exodus: "And God said unto Moses, I AM THAT I AM; and he said, thus shalt thou say unto the children of Israel, I AM hath sent me unto you. And God said, moreover, unto Moses, Thus shalt thou say unto the children of Israel, THE JEHOVAH ELOHIM of your fathers, the God of Abraham, the God of Isaac, and the God of Jacob, hath sent me unto you; this is my name forever, and this is my memorial unto all generations." These words were addressed to Moses "out of the midst of the burning bush," at "the mountain of God" called "Horeb," in which was the cave where Jehovah afterwards manifested himself to Elijah "in the still, small voice." I imagine Moses looking, with entranced vision, from the burning bush and pyramidal mountain at the inscription on the glowing face of the Great Pyramid, and hearing Jehovah say of it, "This is my name forever," and of the Great Pyramid, "This is my memorial unto all generations." Moses was familiar with the inscription, but till then had been ignorant of the meaning of it, as the Egyptian priests continued to be; and he was not afterwards allowed to reveal more in regard to it, and in regard to the altar on which it was inscribed, than is recorded in the text, for the simple reason that the full import of his message to the children of Israel was reserved for the fullness of times.

From the midst of the burning bush the unconsumable Jehovah said to Moses, "Certainly I will be with you; and this shall be a token unto thee, that I have sent thee; when thou hast brought forth the people out of Egypt, ye shall serve God upon this mountain." In fulfilment of this prediction, God brought Moses from the Great Pyramid, which Mr. Skinner explains to be the "*Rock at, or out of Water*," or the "*Water out of the Rock*," or what is meant by the word *Egypt*, back to the Sinaitic Peninsula, or land of Midian, and stood "upon the

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rock in Horeb," while from the cleft in its smitten side flowed the water of life for the thirsty people, of whom and of the rock Paul says, "They drank of that spiritual rock that followed them, and that Rock was Christ."—(1 Cor. x., 4.) "They were all baptized into Moses in the cloud and in the sea," because Jehovah, in a pillar of cloud by day and of fire by night, leading them from "the Rock out of the Water" to "the Water out of the Rock," led them due east, on the thirtieth parallel, through the baptismal font, to symbolize "the straight and narrow way that leadeth unto life," in contradistinction from the way by which their fathers went down into Egypt, symbolizing "the broad road that leadeth to destruction," from which the multitudes of mankind are to be saved through the instrumentality of "the chosen seed."

To return to the message of Jehovah to the children of Israel by the hand of Moses. It is easy to see that the phrase "I AM THAT I AM," or simply "I AM," is equivalent to *self-existence*, or *absolute being*, and that this is what is meant by the name "Jehovah," or, according to the Samaritans, "Jahvah," the most probable derivation of which is said to be "from JAH, the *Essence*, and HAVAH, *Existing*." Whether this be the correct derivation or not, the name is that by which the children of Israel were thenceforth to recognize "the God of Abraham, the God of Isaac, and the God of Jacob," as the divine trinity which they were required to worship and serve, in distinction from that of the Egyptians, the worship and service of which they were required to abandon. By "the Jehovah Elohim of your fathers" is meant, according to literal translation, neither more nor less than *the Self-Existent Gods of your fathers;* and this implies the circle of Self-Existence handed down to us through the old philosophers, *i. e.*, "Cause, Means, and End," in the divine trinity of "Father, Son, and Holy Spirit," of which the Father is "the God of Abraham," the Son "the God of Isaac," and the Holy Spirit "the God of Jacob." In agreement with the first named relationship is the pre-eminently fatherly character of Abraham, as well as the meaning of his name, Abram, *High Father*, and Abraham, *Father of a Multitude;* in agreement with the second is not only the meaning of the name

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Isaac, *i. e.*, *Joy* ("for joy that a man-child is born into the world"), but also the singular fact of Abraham's sacrifice of his only begotten son and heir, under the symbol of a lamb, upon the altar on Mount Moriah; and in agreement with the third relationship is not only the meaning of the name Jacob, *i. e.*, *Supplanter*, signifying the comparitively feminine character of this patriarch, in respect to his methods of successful competition with the predominantly masculine character represented by Esau, but also his exceeding spirituality, and his entranced and ecstatic conditions, in which "the Mighty God of Jocob" appeared to him in the form and character of "an Angel," reminding us of the omnipotence of the gentle and regenerating influences of the Holy Spirit, and of all those maternal and heavenly attributes which are so fitly symbolized by the dove. The Divine Son was, is, and ever will be the divine paternal means to the divine maternity, and is included in his beginning and end, none the less for being their most perfect embodiment, for the simple reason that the means is eternally and of necessity included in the First and Final Cause. Thus "the Gods" of Abraham, of Isaac, and of Jacob, are seen to constitute the Self-Existent Being, the triune Jehovah; and seeing that this name was revealed to Moses, by a clear explanation of it, in order that "the Gods of Israel" might be "forever" distinguished from all "other Gods," how can it be otherwise than wrong to translate "Jehovah Elohim" by the words "LORD God," and to substitute "Lord GOD" for "Lord Jehovah," merely hinting at the true translations by underscoring "LORD" in the one case, and "GOD" in the other? To me, this persistent determination to suppress and circumvent a great and obvious truth, and that truth the most vital and salvatory truth of the Bible, is something astonishing.

But what about Jehovah's "memorial to all generations?" Is it his name, which he so impressively announced to the children of Israel? or is it his Great Memorial Altar, on which his name might have been inscribed? I take it to be the latter, because several memorial altars, besides this greatest of them, are spoken of in the Bible, while it is only the commentators who speak of a "memorial name." They say that the question,

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"What is his name?" refers to his name alone, and that, therefore, his answer to it can refer to nothing else. But suppose the name to have been inscribed upon the Great Memorial, and that thereby Moses and the children of Israel were familiar with it without knowing its meaning: in this case, the "name" and the "memorial" were not one and the same, but one and inseparable, so that mention of either, to be in the highest degree intelligible, necessited mention of the other. By analogy with the altar named "El-Beth-el," with the one named "El-Elohe-Israel," and with the one named "Jehovah-Nissi," I now think that the inscription on the "Altar to Jehovah in the midst of the land of Egypt" was "JEHOVAH ELOHIM," rather than "SACRED TO JEHOVAH." And let me ask those who look upon the Great Pyramid as the Great Memorial Altar, "for a witness to Jehovah of hosts in the land of Egypt," how they can so regard it without believing, or at least admitting the rationality of the belief, that the inscription upon its pure white surface was the name of the Being to whom it was dedicated, and to whose attribute of self-existence, as symbolized in "the tree of life in the midst of the garden," it was "a witness," a "memorial to all generations?" Is not this vastly more consistent with their belief in the divine origin of the Great Pyramid than the notion that the inscription upon it was the modern "hieroglyph of *degrees, minutes, and seconds*," recording some one or more of those mathematical and astronomical relationships which the architect had already recorded in the parts and proportions of the structure, external and internal, to be unfolded to their interior perception through the enlightening influences of the Spirit of Truth? The geometrical character of the Great Pyramid was sufficiently obvious to need no written indorsement; but in the physical sciences, even in the sublimest of them, men do but grovel, unless elevated by a high religious sentiment; and hence the appropriateness of the inscription, JAHVAH ELOHIM, or JEHOVAH ELOHIM—a name in which are just as many letters as in the motto, "ANNUIT CŒPTIS," and as many as there are "signs of the times" in that circuit of the heavens which is alluded to in the mandate,

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"Extol him that rideth upon the heavens by his name JAH, and rejoice before him."—(Ps. lxviii., 4.)

Jehovah's message to the children of Israel through Moses, calling them from idolatry to the worship of himself, was re-echoed in the far off ages by David, in the words, "Thy name, O Jehovah, endureth forever; and thy memorial, O Jehovah, throughout all generations."—(Ps. cxxxv., 13.) Here the "name" and the "memorial" are still more evidently distinct and yet most intimately related. That the message was prophetic, as well as historic, we see in its allusions to the future, as well as the past. It was as true of David's time as of that of Moses, and it is as true of our time as it was of David's. That it was a call from slavish idolatry, and that it was the very beginning of Israel's knowledge of Jehovah, is evident from this in Ezekiel: "Thus saith the Lord Jehovah: In the day when I chose Israel, and lifted up mine hand unto the seed of the house of Jacob, and made myself known unto them in the land of Egypt; when I lifted up mine hand unto them, saying, I am your Jehovah Elohim; in the day that I lifted up mine hand unto them, to bring them forth of the land of Egypt into a land that I had espied for them, flowing with milk and honey, which is the glory of all lands; then said I unto them, cast ye away every man the abominations of his eyes, and defile not yourselves with the idols of Egypt: I am your Jehovah Elohim." (xx, 5-7.) It is remarkable in this passage that the lifting up of the hand, which is "a witness" or "memorial to all generations" of the faithfulness of the Almighty to his promises, is mentioned, in a painstaking way, just as many times as there are persons in the Divine Trinity, "the God of Abraham, the God of Isaac, and the God of Jacob;" and it makes me think that, in addition to the symbolization of the Divine Trinity in the Great Pyramid, there may also be an allusion in it to the three "high places," *Aramæus, Ammosis, and Inaron*, the first built by Joseph, the second by Moses, and the third by Aaron, (See STANDARD, vol. ii, pp. 26, 27); for Joseph said to his brethren, "God hath made me a father unto Pharaoh;" Moses referred to himself as a type of the Son of God in the words, "Jehovah thy God will raise up unto thee a Prophet from the midst of thee,

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of thy brethren, like unto me;" and Aaron was "the mouth," the voice, the breath of Moses, reminding us of the words of our Lord, "When the Spirit of Truth is come, he shall guide you into all truth; for he shall not speak from himself, but what things soever he shall hear shall he speak; and he shall declare unto you the things that are to come. He shall glorify me; for he shall take of mine, and shall declare it unto you."

In Daniel vii., 18, the words translated "the Most High" in the text, are in the margin translated, "*high ones, i. e., things,* or *places.*" They refer to the Divine Trinity, under the symbol of the three Great Pyramids of Gizeh, do they not? The *Most* High, who is also called "the Highest," is JAH, the essential divine, *i. e.*, the Divine Father, and certainly appears to be sometimes spoken of under the symbol of the highest of the three great Pyramids; as we see in the words, "He that dwelleth in the secret place of the Most High, shall abide under the shadow of the Almighty. I will say of Jehovah, He is my refuge, and my fortress: my God; in him will I trust."—(Ps. xci., 1, 2.) In the 9th verse of the same psalm, David says, "Because thou hast made Jehovah, which is my refuge, even the Most High, thy habitation, there shall no evil befall thee, neither shall any plague come nigh thy dwelling." Of the same import is the first verse of the Psalm entitled, "A prayer of Moses, the man of God," which says, "Jehovah, thou hast been our dwelling place in all generations."—(Ps. xc.) It apparently refers to the one great "Memorial unto all generations," as that on which was the name pointed out and explained by Moses to the children of Israel in Egypt. Indeed, in this very inscription, "Jehovah Elohim," the Egyptian priests, by a perversion not altogether strange, may have read their own Hermetic trinity of "End, Cause, and Effect," under the names of Isis, Osiris, and Horns, when they said to Herodotus that it signified "the number of radishes, onions, and garlicks eaten by the workmen;" for these plants had a sacred significance in the eyes of the Egyptians, by virtue of which the eaters of them symbolically appropriated the divine attributes; somewhat as in the unfermented bread and wine of the passover Christians

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symbolically appropriate the body and blood of the Lamb of God, the divine wisdom and love of their risen Lord.

The Great Memorial is also called after the name inscribed upon it, *i. e.*, "Jehovah," by the prophet Hosea, where he says of Jacob, "Yea, he had power over the angel, and prevailed; he wept, and made supplication unto him: he found him in Bethel; and there he spake with us, even the Jehovah Elohim of hosts; Jehovah is his memorial."—(xii., 4, 5.) The memorial here mentioned can hardly be mistaken for its name, and can, therefore, hardly be mistaken for the name of the Being memorized by it. Remembering that Jacob wrestled with the angel in vain for his name, though successfully for his blessing, and that Bethel was the place of Jacob's prophetic vision of the great stairway from earth to heaven, with the Jehovah Gods of Abraham, of Isaac, and of Jacob speaking to him from the top of it, the statement of Hosea that "there he, even the Jehovah Elohim of hosts, spake *with us*," and that "Jehovah is his memorial," becomes very significant. It suggests "our inheritance in the Great Pyramid." The plain inference is, that the name for which Jacob prayed in vain was revealed to the builder of the Great Step-Pyramid of Gizeh, to be inscribed by his direction on the finished pyramid, the Great Memorial Altar, and that the builder was Jacob's heir to the vision, with all the divinity and universality involved in the elaboration and embodiment of it. If it be said that the Almighty announced himself to Jacob as "Jehovah, the God of Abraham thy father, and the God of Isaac," and that Jacob is reported as saying, "Surely Jehovah is in this place and I knew it not," I reply that we are to understand such statements of Moses (if they are his) in a manner consistent with his report of this express declaration of Jehovah to himself, "I appeared unto Abraham, unto Isaac, and unto Jacob, by the name of God Almighty; but by my name Jehovah was I not known to them."—(Ex. vi, 3.) It is commonly thought that the place where Abraham sacrificed the ram instead of his son he called "Jehovah-jireh," to comemorate the fulfillment of his answer, "My son, God will provide himself a lamb for a burnt offering:" but the Hebrew of "God will provide" is "Elohe-jireh," not "Jehovah-jireh;" and this leads

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me to suspect that the name Jehovah, wherever it occurs previous to Ex. iii., 15, was surreptitiously introduced by some over-zealous transcriber of the time of Ezra, in the supposed interest of monotheism. The name is absent from all the poetically inspired utterances of the book of Genesis, because with these the transcriber did not dare to interfere. In Jacob's death-bed inspiration, following his invitation, "Gather yourselves together, ye sons of Jacob, that I may tell you what shall befall you in the last days," he makes mention of "the mighty God of Jacob," of "the God of thy father," and of "the Almighty," all in the blessing pronounced upon Joseph: but not once in the entire prophecy does he name the name of Jehovah; and why not except that it had not been revealed to him? The inference is, that if it was revealed to aybody before Moses, it was revealed to Zaphnath-paaneah, "which in Coptic signifies *a revealer of secrets, or, the man to whom secrets are revealed.*" "The good will of him who dwelt in the bush" was shown to Moses in the revelation of his everlasting name in connection with his "memorial unto all generations;" and for this good will Moses blessed Joseph, showing, I think, that we may bless him for "our inheritance in the Great Pyramid."

J. W. REDFIELD.

OUR NATIONAL MOTTO—"*E PLURIBUS UNUM.*"

To those who have a mind to observe the distinctive characteristics of our Nation which mark the difference between it and the other nations of the earth, and who can discern something of the deep significance of the symbols adopted at its beginning to set forth its high purpose and mission, there comes a growing conviction that more than human wisdom directed that little company of men in the choice of emblems that should fitly represent this Nation among the nations of the earth.

In the Bible are these words written by the prophet Amos (Amos iii: 7): "Surely the Lord GOD will do nothing but he revealeth his secret unto his servants the prophets."

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Therefore, with confidence, we may look into his word to find from whence came this people, and what he has said concerning them.

Let us take our national motto, "*E pluribus unum*," whose meaning is, of many, one: because, this people is *one* GREAT NATION, composed of MANY INDEPENDENT NATIONS or States, confederate.

Let us compare this with what God said to Abram, and see if it may not be that the United States is the nation and many nations promised to him; and, if so, then God's people Israel, and heirs to the inheritance promised to him and to his seed.

There are many writers, to-day, in our own country and abroad, who are asserting that England is Israel, the "great nation and company of nations"; but, knowing we came of the same people, and are a great nation, they seem to be of necessity compelled to allow us some place, and by tracing the birthright promise down to Joseph's two sons, they find Ephraim to be the greater, and Manasseh the smaller, and have assumed England to be Ephraim and the United States to be Manasseh, claiming the greatness of the blessing given to Abraham as England's alone.

Let us begin with Gen. xii, and examine carefully, and see what God says: "Now, the LORD had said unto Abram, Get thee out of thy country, and from thy kindred, and from thy father's house, unto a land that I will shew thee, and I will make of thee a great nation, and I will bless thee, and make thy name great; and thou shalt be a blessing, and I will bless them that bless thee, and curse him that curseth thee; and in thee shall all families of the earth be blessed."

Again (Gen. xvii), "When Abram was ninety years old and nine, the LORD appeared unto Abram, and said unto him, I am the Almighty God: walk before me and be thou perfect, and I will make my covenant between me and thee; and will multiply thee exceedingly. And Abram fell on his face: and God talked with him; saying, as for me, behold, MY COVENANT is with THEE, and thou shalt be a father of many nations, neither shall thy name any more be called Abram (High Father), but thy name shall be called Abraham (Father of a multitude), for

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a father of MANY NATIONS have I made thee, and I will make thee exceeding fruitful, and I will make nations of thee; and kings shall come out of thee, and I will establish my covenant between me and thee, and thy seed after thee, in their generations (their literal seed) for an EVERLASTING COVENANT, to be a God unto thee, and to thy seed after the and I will give unto thee, and to thy seed after thee, the land wherein thou art a stranger, all the land of Canaan, for an everlasting possession; and I will be their God."

It is afterward affirmed to Isaac, in these words, (Gen. xxvi:3) : "Sojourn in this land and I will be with thee, and will bless thee; for unto thee, and unto thy seed, I will give all these countries; and I will perform the oath which I swear unto Abraham thy father, and I will make thy seed to multiply as the stars of heaven, and will give unto thy seed all these countries, and in thy seed shall all the nations of the earth be blessed."

Afterward it is reaffirmed to Jacob, in these words (Genesis xxviii), "I am the LORD, God of Abraham thy father, and the God of Isaac: the land whereon thou liest, to thee will I give it, and to thy seed: and thy seed shall be as the dust of the earth; and thou shalt spread abroad to the west, and to the east, and to the north, and to the south" (this spreading abroad was not accomplished at the time the twelve tribes dwelt in Canaan). "And in thee and in thy seed shall all the families of the earth be blessed, and behold, I am with thee, and will keep thee in all places whither thou goest, and will bring thee again into this land: for I will not leave thee until I have done that which I have spoken to thee of."

(Gen. xxxv, 9–12), "And God appeared unto Jacob again, when he came out of Pana-aram, and blessed him; and God said unto him, Thy name is Jacob; thy name shall not be called any more Jacob, but Israel shall be thy name; and he called his name Israel (*i. e.*, Prince or God). And God said unto him, I am God, Almighty; be fruitful and multiply: *a* NATION and a COMPANY OF NATIONS shall be of thee, and kings shall come out of thy loins; and the land which I gave Abra-

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ham and Isaac, to thee will I give it, and to thy seed after thee will I give the land."

In after years when the time drew nigh that Israel must die (Gen. xlviii), "Jacob said unto Joseph, Now thy two sons Ephraim and Manasseh, which were born unto thee in the land of Egypt, are mine." And Israel stretched out his right hand and laid it upon Ephraim's head who was the younger, and his left hand upon Manasseh's head, guiding his hands wittingly: for Manasseh was the firstborn, and he blessed JOSEPH, and said, God, before whom my fathers Abraham and Isaac did walk, the God which fed me all my life long unto this day, the angel which redeemed me from all evil, bless the lads and let thy name (Israel) be named on THEM, and the name of my fathers Abraham and Isaac; and let them like fish grow into a multitude in the midst of the earth, and when Joseph saw that his father laid his right hand on the head of Ephraim, it displeased him; and he held up his father's hand to remove it from Ephraim's head unto Manasseh's head, and Joseph said unto his father, Not so, my father; for this is the firstborn; put thy right hand upon his head, and his father refused and said, I know it, my son, I know it: he also shall be great: but truly his younger brother shall be greater than he, and his seed shall become a MULTITUDE OF NATIONS."

Before the children of Israel went out of Egypt, God said to Moses (Ex. iv: 22), "Thou shalt say unto Pharaoh, "Thus saith the LORD, Israel is my Son, even my firstborn."

After they were delivered from Pharaoh and led through the wilderness into the land of Canaan, and had become a kingdom in that land, in about 975 B. C., they were divided and became two kingdoms—the kingdom of Israel and the kingdom of Judah. While in this condition, in about 740 B. C. came Tiglathpileser and took Naphtali, Reuben, Gad and half tribe of Manasseh and carried them away into Assyria. In about 719 B. C. the King of Assyria beseiged Samaria, and carried Israel away into Assyria. "So all the house of Israel were carried away into Assyria," from thence they were to be scattered and spread abroad.

As they are not remaining in that land, the next thing is to

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find whither they are gone. God had said by the Song of Moses (Deut. xxxii: 26), "I will scatter them into corners, I will cause the remembrance of them to cease from among men,"—and by the prophet Amos he said (Amos ix: 9), "I will sift the house of Israel among all the nations, like as corn is sifted in a sieve yet shall not the least grain fall upon the earth." Here is a declaration that though their nationality should become lost to the world and to themselves, yet God would know every one of them; and we find he had appointed a place where they should be found.

By Jeremiah he says, (Jer. iii: 10-12.)"Go, proclaim these words toward the north, and say, return thou back-sliding Israel, saith the LORD; and I will not cause mine anger to fall upon you, for I am merciful saith the LORD, and I will not keep anger forever: only acknowledge thine iniquity, that thou hast transgressed against the LORD, thy *God*, and hast scattered thy ways to strangers under every green tree, and ye have not obeyed my voice, saith the LORD." His word by Isaiah concerning their return gives another point of location: (Isa. xlix)—"Behold these shall come from far, and lo, these from the north and from the west" and again by Jeremiah: "Behold, I will bring them from the north country, and gather them from the coasts of the earth." Hear the word of the LORD, O ye nations, and declare it in the Isles afar off, and say, He that scattered Israel, will gather him, and keep him as a shepherd doth his flock."

Follow these directions from Jerusalem, where the prophets stood, and it brings you to the northwest coasts of Europe and the British Isles.

In the blessing pronounced by Moses upon JOSEPH, he said: (Deut. xxxiii: 17.)—"His glory is like the firstling of his bullock, and HIS HORNS are like the horns of the unicorn, (or as Smith's dictionary gives it—the wild ox or buffalo; and refers to the two tribes which sprang from one—*i. e.*, Joseph; as two horns from one head) with them (the horns) he shall push the people (banished Israel) together (not apart) to the ends of the earth, and they (the horns) are the ten-thousands of Ephraim, and they are the thousands of Manasseh."

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Those writers who have claimed that England is Ephraim, and United States, Manasseh, have separated the people belonging to the two sons of Joseph:—1st, by a great ocean; 2nd, by a different form of government; 3d, they have not observed the blessing of Jacob, as given in Gen. xlviii: 16, when he said, "Let my name (Israel) be named on them, and let THEM grow—as fishes do increase—into a multitude in the midst of the earth."

In the words of an American statesman, this nation is "a clasp between Europe and Asia" (Charles Sumner, Aug. 1, 1853). In the language of an American historian, it is "a Colossus that will grasp Europe in one hand and Asia in the other."—(Draper's "Civil War in America," vol. 1, page 183.)

The same writers, to show that Ephraim and Manasseh are to be separated, say that England (as Israel) was to lose United States (as Manasseh), and quote Isa. xlix: 20, "The children which thou shalt have after thou hast lost the other, shall say again in thine ears, 'The place is too straight for me: give place to me that I may dwell;'" thus appropriating to England the comforting words spoken by the LORD to Zion.

This xlixth chapter so full of love and tenderness to the lost people of Israel, does not forget Zion—their ancient land—their desolate heritage, and addressing her, under the figure of a woman mourning for her children that are lost, who in her grief has said, "The LORD has forsaken me, and my Lord has forsaken me," reminds her that, strong as is her love and compassion for her children, there might be a possibility of a mother forgetting even her own son; then in these very touching words the LORD says to her, "Yet will I not forget thee: Behold, I have graven thee upon the palms of my hands: thy walls are continually before me, thy children shall make haste, thy destroyers and they that made thee waste shall go forth of thee, the children which thou shalt have after thou hast lost the other, shall say again in thine ears, 'The place is too strait for me, give place to me that I may dwell.'"

We have heard the word of the LORD saying, "He that scattered Israel will gather him;" but has he told us how, or by whom? Yes! To Israel, who have been "pushed together

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to the ends of the earth," who are lost and know not they are Israel, are addressed these very impressive words, "Listen, O Isles, unto me, and hearken ye people from far: the LORD hath called me (meaning Jesus) to bring Jacob again to him."

And when Jesus appeared on the earth we hear the response from his lips (Matt. xv: 24), "I am not sent but to the lost sheep of the house of Israel." (John x.)—"I am the good shepherd: the good shepherd giveth his life for the sheep. My sheep hear my voice, and I know them, and they will follow me.

And for this purpose the gospel of Jesus Christ was preached by Paul to the Gentiles, that the "glad tidings" might reach Israel. He says (Rom. xi.), "For I speak to you Gentiles, inasmuch as I am the apostle to the Gentiles; I magnify my office—if by any means I may provoke to emulation my flesh and might save some of them; for I would not, brethren, that ye should be ignorant of this mystery, lest ye should be wise in your own conceits, that blindness in part is happened to Israel (the Jews) until the fulness of the nations be come in, and so all Israel shall be saved: as it is written, 'There shall come out of Sion the Deliverer, and shall turn away ungodliness from Jacob."

The gospel can be traced in its course to where God located Israel—in the isles and coasts of the earth; whence arose great persecutions on account of the opposing elements in the nations with whom Israel was mixed.

In the process of time came the fulfillment of this message to Israel by Jeremiah (Jer. l.): "Remove out of the midst of Babylon, and go forth out of the land of the Chaldeans, and be as the he goats before the flocks." (I read in a paper not long ago, "Farmers use goats to protect their sheep from dogs; two goats can drive away a dozen dogs, and two are about all a farmer puts in with his sheep; as soon as a dog enters the field at night, the goats attack him, and their butting propensities are too much for the dog, who soon finds himself rolling over and over: a few repetitions drives the dog from the field.")

Our Pilgrim Fathers are well identified by this peculiar expression of he goats, for they prepared the way before the flocks that have ever since been coming.

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Now, let us turn to Daniel and see what God has made known to him about his chosen people. We find (Dan. ii), "In the days of those kings" (represented by Nebuchadnezzar's image) "shall the God of heaven set up a kingdom, which shall never be destroyed." Is there such a kingdom which has for its government the principles of God's law?

We see the great nation composed of the many nations; and we are sure God brought this people here. We have seen those men assembled in Independence Hall, Philadelphia, signing their names to the Declaration of Independence, appealing to the Supreme Judge of the world for the rectitude of their intentions, and for the support of this declaration, with a firm reliance on the protection of Divine Providence, mutually pledging to each other their lives, their fortunes and their sacred honor," owning no king but Jesus Christ, who said, "All ye are brethren."

We find still further that Daniel was told, "Many shall be purified, made white, and tried." Now, if this Nation comprises the "many," were not our father's purified? Were they not even called Puritans? Did they not come here that they might have liberty to worship God? Is not this pure? And were they not made white in the framing of the Declaration of Independence, when they say, "We hold these truths to be self-evident, that all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are, life, liberty and the pursuit of happiness."

Jesus said, "One is your Master, even Christ, and all ye are brethren." Is not this principle white? and was not our nation tried on this very principle in the late civil war? Verily we are the "many," and we are the one great nation—the kingdom set up by the God of heaven: not that we are ALREADY perfect.

Jesus said (Matt. xiii), "In the time of the harvest the Son of Man shall send forth his angels, and they shall gather out of His kingdom all things that offend and them which do iniquity; then shall the righteous shine forth as the sun in the kingdom of their Father."

And as we are the many nations in one, we must be the ten thousands of Ephraim and the thousands of Manasseh—the house of Joseph.

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Jacob in blessing Joseph said: "From thence is the shepherd, the stone of Israel."

And the LORD says by Isaiah, "Cyrus is my shepherd" (Isa. xlv). "I will loose the loins of kings to open before him the two leaved gates, and the gates shall not be shut." (May not this refer to the two granite leaves in the Great Pyramid?) "And I will give thee (Israel) the treasures of darkness, and hidden riches of secret places, that thou mayest know that I, the LORD, am the God of Israel."

EMILY DAMON.

METROLOGISTS OF THE INSTITUTE.

Four years and a half ago, to-wit., the 17th December, 1879, this Society took the first step toward "Perfecting our Weights and Measures." At that time a paper was presented by Mr. George C. Davies, under that title, in which a review of our tables of weights and measures was given, and an attempt made to bring order out of chaos by striking out all the superfluous terms, that like barnacles had been engrafted on the system by the countless ages and peoples making use of the inch as its unit of measure. Not only were these superfluous terms to be stricken off, but it was recommended to drop entirely all measures of capacity, and sell all commodities by the pound of 7,000 grains. It was also recommended that Troy and Apothecary weights be dispensed with, and the grain made the unit of weight, and the inch the unit of measure. Should these suggestions be carried out we should have one set of measures—namely, the inch, foot, yard and mile—for all dimensions, whether linear, superficial or solid; one set of weights, namely, the grain, pound, kentle of 100 lbs., and ton of 2,000 lbs. for all commodities, whether solid, fluid or dry; one set of measures for land, based on the unit above given —being the same as now used, as all such measures have since the beginning been subjects of record, and cannot be disturbed.

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The different multiples and subdivisions of the terms given above may be made either by eighths, quarters and halves as now, or decimally, as may be preferred—though it was recommended that the pound should be divided into 10 parts instead of 16 for the convenience of accountants, as well as ordinary traders.

Carrying out a system based on these suggestions the student would have only the following terms to charge his memory with, namely:

For extension—inch, foot, yard, mile, - -	4
" weight and capacity—grain, pound, kentle, ton,	4
In all, - - - - - -	8

The multiples and subdivisions being always given in simple arithmetical terms known to every school boy or girl in the land. This would seem to be about as simple a system as could well be devised, and with the advantage of being based on our well known system. It has not, however, met with favor from the metrologists of this Society, or of the International Institute —most of whom seem to think that an ideal system must be evolved from the old, forgetting apparently that the mission of the Society is to "preserve and perfect the weights and measures in use." They seem also to forget the measures of the Pyramid were limited to two—the inch and the cubit—though authorities differ very greatly as to the length of the cubit. As it was probably a multiple of the inch, it would be well for improvers to limit themselves to the original unit.

There seems also to be a strong conviction in the language of the Chairman of the Society's Committee on Weights and Measures that "*We wust have a decimal system*"—"or be compelled to adopt the metric system." Now it will be unnecessary to discuss this question, for it seems perfectly clear that no power on earth will compel the Anglo-Saxon race to discontinue the use of the inch, foot, yard, mile, or the grain, pound and ton—none of which are decimal to the others. It may consent, and has practically so consented for many years to divide these quantities decimally. If this be true, and I think the experience of ages will bear out the assertion, what is the

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use of bothering our brains about a decimal system, based on our old units, or any other?

Again, the metrologists of the Society seem to think that a separate name must be had for each separate multiple or subdivision of the unit, hence we have an array of new terms such as podes, decapodes hectopodes, kilopodes and other "heathen Greek" terms requiring a special effort of the memory to recall. These special terms are the *bete noir* of our present system and are answerable for the confusion now existing. Besides, what is the use of these special terms, anyway? With the eight terms given above, namely, inch, foot, yard, mile—grain, pound, kentle—which may be dispensed with—and the ton, the dimensions, weight or capacity of any physical substance or extent can be easily or accurately determined to the minutest fraction, and in language taught daily in every school-room in the land. If gentlemen wish to try their hands in devising a system of weights and measures, let them start out with a new unit and build up a new system upon that. They will be much more likely to achieve success in that direction than in attempting to decimalize the old, and, too, with the almost certain result that their fine drawn theories will be entirely ignored by the people.

Could the Society realize the fact that the easiest and shortest way to dispose of the French metric system will be to memorialize Congress to make the Anglo-Saxon weights and measures above named the legal and only standards of the country in the way proposed in a paper read before the Society in 1882, and published in the second volume of the Society's Proceedings, and enforce their memorial with all the social influences of the Society, I think we should cease to hear of the French metric and its zealous advocates, for we have the people with us.

GEO. C. DAVIES.

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PYRAMID STUDIES.

Mr. Flinders Petrie persists in maintaining that the base side (9068.8″ ±.65) at the *pavement* level is the only real one intended to be monumentalized by the architect. He ignores the four horizontal and larger squares below it, severally indicated most plainly by the four socket levels, so carefully placed at different depths upon the fundamental diagonals. Now, of course, with all other true Pyramid-students, I believe that the sides of the four squares indicated by the sockets are of immense importance, and am disposed to believe that in the several articles published in the last numbers of the STANDARD we are placed upon the right track for their due interpretation. Nevertheless this *pavement* base length must not be overlooked. It was, as a line, perhaps the most notably defined base of the whole monument. Can it be $\frac{28500}{\pi} = 10000 \times \frac{1}{2}(5.7) \div \pi$? Is it 100 times the coffer's length? or whence was it derived? It certainly must have a simple π relation.

Be this, however, as it may, I am pretty well convinced that the *displacement* of the entrance axis east of the central vertical plane of the Pyramid is a direct π function of this pavement base line. This displacement is given by Petrie as 287.0 ± .8 E (page 55). Again, on page 65, where he locates the axis of the south end of the ascending gallery, in the same plane, he gives it as 187. ± 1.5 E. Divide now 9068.8 ±.65 by 10π and you have 288.66 +, a quantity close enough to indicate that the *theoretical* displacement is $\frac{1}{10}$ the pavement base $\div \pi$.

Again, Petrie gives the displacement of the end of the descending gallery south of the pavement base as 2907.3 ± .6, a quantity which looks like 9131.05 $\div \pi$.

The main point in all of these displacements is to get the true, theoretical function for the pavement base. The value in British inches is undoubtedly around about 9068. $\mp x$, and the main question, therefore, is, what the absolute form of the function is?

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There is one other question about which I want to say a word. It is upon the little note published in the last STANDARD, over Mr. Dow's name, entitled, "Prove all Things."

Now, while Mr. Dow is manifestly correct in his conclusion that, so long as the Pyramid is what may be termed a π-pyramid, "the so-called 10 to 9 slope of the corners of the Pyramid is a falsity," it by no means follows that whatever the actual π slope may be, *it* is not an intended indication of the sun-distance. The nine on ten ($\frac{9}{10}$) slope is the closest possible approximation to the actual one which may be written in the fundamental numerals, and yields an astonishingly accurate (91,836,011. miles) value for the mean solar radius. The several arguments in favor of the height of the Pyramid being intended as a factor of the mathematical function of this solar radius remain in force whether the true slope be $\frac{9}{10}$ or something else.

Now, if the monument be actually built, as it undoubtedly is, in π proportions—*i. e.*, if it be so to speak, a *π-Ka-metron*—then the absolute slope along the arris lines is $\frac{4}{\pi\sqrt{2}}$. It is a noticeable fact that "Ahmes in his mathematical papyrus defines pyramids by their sloping height up the arris edge, and their diagonal of the base beneath that line." And this ancient and well informed authority lends credence to the form of function adopted by the elder Petrie in his pyramidal expression H. $(10)^9$ for this required distance.

Let us examine this matter a little closer, and, to do so, designate the height by H, the base by B and the diagonal by D, a π-pyramid now being under consideration. Taking now the usual British inch formulas we have

$$B = \frac{180^2}{2\sqrt{\pi}} = \frac{16200}{\sqrt{\pi}}$$

$$H = \frac{180\ A}{\sqrt{\pi}} = \frac{32400}{\pi\sqrt{\pi}}$$

$$D = B\sqrt{2} = \frac{16200\sqrt{2}}{\sqrt{\pi}}$$

$$\tfrac{1}{2}\ D = \frac{8100\sqrt{2}}{\sqrt{\pi}}$$

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Hence the ratio of H to ½ D, or the slope up the arris line, is therefore accurately

$$\frac{H}{\frac{1}{2}D} = \frac{\frac{32400}{\pi\sqrt{\pi}}}{\frac{8100\sqrt{2}}{\sqrt{\pi}}} = \frac{4}{\pi\sqrt{2}} = \frac{2\sqrt{2}}{\pi} = .900316315 + \text{ on } 1$$

$$\text{or} = 9.00316315 + \text{ on } 10$$

Hence Mr. Petrie's formula for the sun-distance becomes

$$S = \frac{32400}{\pi\sqrt{\pi}}(10)^{9.00316315\ +}$$

$$= (5818.622870 +)\,(10)^{9.00316315\ +}$$

But from the principle of logarithmic powers and roots the Log. of $(10)^{9.00316315\ +}$ = logarithm of $10 \times 9.00316315 +$

$$= 1. \times 9.00316315 +$$

$$= 9.00316315 +$$

and therefore the number corresponding to the logarithm 9.00316315 + is the factor by which, if we multiply 5818.622870 +, we shall get the Pyramid sun distance!

Now, the foregoing considerations strike me as remarkable in several ways. In the first place we have obtained an absolute form for the Pyramid sun distance, to wit:

$$S = \frac{32400}{\pi\sqrt{\pi}}(10)^{\frac{20\sqrt{2}}{\pi}}$$

In the second place we find that the only practicable way of solving the equation, or rather of reducing the function is by *logarithms*, and hence are justified in assuming *that the architect also understood their nature thoroughly*, for the very formula we have obtained demands, as its only determinable solution, that 5818.62″, etc., shall be multiplied by the number whose logarithm is 9.90316315 + !

Again, I want to call your attention to the several dimensions indicated upon the eastern base of the Pyramid. The fundamental base line is undoubtedly indicated by the S. E. socket level, and seems unquestionably to be 9139.871254 + = $\frac{16200}{\sqrt{\pi}}$ in terms of the British inch, with which unit it may have been foreseen the measurements were eventually to be made. Now Petrie's measured eastern socket line (*i. e.*, from S. E. to

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N. E.) seems also to indicate the distance 9131.05 in British inches. The former of these lines is horizontal, as are all the courses of the Pyramid; the latter or socket line is inclined. This latter, therefore, cannot be intended for recording anything but a *ratio*. Actually it is the year number (365.242+) multiplied by the cubit number (25.) And hence if we take the horizontal distance 9139.87125 + and divide it by 365.242+ we shall obtain the true earth-commensuric length of cubit in terms of British inches 25.024 + and the ratio of 25:25.024+ calculated out so far as we are *sure* of the year number, or *vice versa*, will give us the true increment to 25 British inches, by means of which we have the "*sacred cubit*" undoubtedly registered in the fundamental horizontal line (distance due north from S. E. socket, to its intersection with the N. E. diagonal at same level).

It is a pointed fact that the E. socket line 9131.05= (365.242+) × (25), no more and no less. It is also pointed that 25. *British* inches is *not* a clean function of the polar axis. It is, however, equally apparent that $\frac{9139.87125+}{365.242+} = 25.0241+$ *is* a clean value, to wit: 1-10000000 of the polar axis, and as this distance, and not the socket line—which *slopes*—is intended for absolute measure, I cannot but feel that our British measuring unit has been only foreseen as a means towards the real end in view. I have seen no argument yet advanced which goes to establish the British inch as commensuric with the *Polar axis* in grand round numbers. Now, it is clearly the *Earth*, and not the Pyramid alone, that we are after, and I must reiterate, what I have often, with Mr. Clark, called attention to before, that the simple determination of a series of formulæ which, depending upon the 360° division of the circle (undoubtedly a *false* and Babylonish method), and coming out in British inches, does not and cannot establish earth-commensurability. If these things are so, and if we obtain a complete set of formulæ, running all through the Pyramid, in terms of the 360° circle and the British inch, then every dimension so resulting must be reduced to the earth-commensuric inch indicated so clearly in the fundamental base, or "*we are left.*" I really think it would

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be well to read again the questions I propounded in the letter published July, 1883. Question 7 is the pointed one in this connection. If the answer to it is in favor of the British inch, which yields for the socket line $365.242 \times 25. = 9131.05+$, then the reply to it is: This inch is not earth-commensuric—its relation to the polar axis is not 1-500,000,000th, but is an irregular number, and the architect failed to grasp the terrestrial dimensions *accurately*.

Now I believe he *did* grasp them accurately; but that he did so in the geometric cubit $25.024 \pm$British inches. I have not seen a single reply to the objections against the 360° division of the circle. Has the Cleveland branch of the Institute anything to advance in its favor as a *correct* geometrical and numerical subdivision? If so I, for one, would like to hear the arguments.

Briefly, my present position is this: I believe that most all of these beautiful British inch formulæ are correct. But I believe also that each one of them must be reduced by the ratio of the earth-commensuric inch to the British inch, in order to pass to and obtain *Earth* facts. I feel that a part of the wisdom of the architect, or else of the inspiration that guided him, was to arrange this monument so that when the time came for it to *be* measured it should be read *noticeably* in terms of the unit used, but point as noticeably towards the *real one intended*. Now this idea is in keeping with the past history of the monument itself. For I am beginning to believe that when this same mysterious monument was erected by Egyptians under Hyksos direction, its dimensions were laid out in still another measure. I do not believe that it was laid down in either British cubits of 25″ or sacred cubits of 25.″024+ but in 20.″636+ cubits of Egyptian daily use. Everything seems to point me to this conclusion, to wit, that it was built in one measure, intended to be measured in another, and at length irresistibly designed to expose the *real truth* is still a third—the earth-commensuric cubit!

Take these ideas for what they are worth. They are founded upon pretty good premises, and truth will at length prevail; and view this matter as we will, we may be certain that who-

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ever built the Pyramid has wrought far more wisely than he knew.

Yours, sincerely in the search of truth, and willing to accept it when it is proved, though it overturns all my ideas.

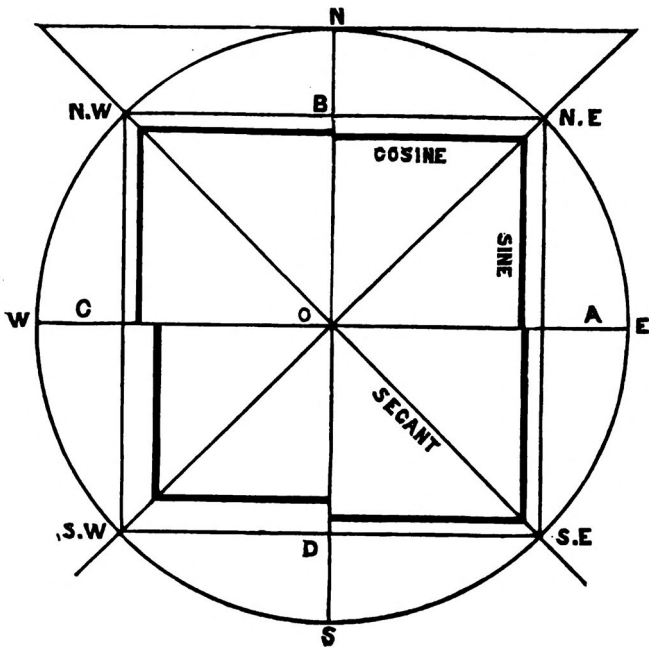
C. A. L. TOTTEN.

THE STRUCTURE OF THE BASE.

As a still further proof that the architect plotted the general plan and structure, and laid it out on the solid rock as a sort of trial plot of the triangulation and work to be done and embodying all the leading features of the future edifice, and as a guide to the builders, we may point to the well-known "trial passages" found on the east side of the Great Pyramid. They form a model of the Pyramid's passages, shortened in length, but of full size in width and height. They are, in fact, exact copies, and are simply "trial passages," to be used by the builders as models of the descending, ascending, and grand gallery passages.

Our object in this article is to supplement what has already been published in our last article to the effect that the general working plan plotted on the spot was a trignometrical arrangement of sines, cosines and tangents, such as is usually found in our common text books on trigonometry in relation to surveying and trial plotting a triangulation. We illustrated our statement with the following diagram:

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The rock cuttings in front of the Pyramid, on the east side, were in like manner plotted from accurate offsets, as may be seen by reference to Petrie's Plate III. There is good reason for supposing that the east side of the Pyramid was laid out in front of the base. The axis of the north trench is about 1086 inches on the ground from the east base of the Pyramid, and this is about the height of the grand gallery entrance on the sloping face. The axis of the south trench is about 1126 inches from base, and agrees with the height of the queen's horizontal passage. Whilst the outer edge of the great basalt pavement is about 2150 inches from the base, and agrees with the height of the king's room on the sloping face of the Pyramid.

The axis of the north and south trenches may represent a tangent to a circle equal to the core base of the Pyramid, in general terms. But, as we see from the diagram, the core lines are not identical on the east side, nor in the alignment. Therefore, the tangents to the core base cannot be the same. Ac-

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cordingly, we find the north and south trenches have not the same axis. The south trench is a tangent to a circle nearer the finished base of the casing = 115 inches from the finished base, whilst the north trench is tangent to a circle more distant from the finished base = 165 inches. The difference in these tangents will be the difference in the thickness of the casing. And this agrees well with the results, as found by actual measurement. The casing averages, according to Petrie (pp. 43, 185), 108 thick at the base and about 33.7 at the corners.

This remarkable fact was noticed by Petrie in his recent work. He says: "The inner ends of the trenches are said to be points lying on the circle equal to the finished base of the Pyramid. The inner end of the north trench is nearest to the circle, being 5,782 from the Pyramid centre; the Pyramid height being 5776±6, or the radius of the base circuit 5,773.4. A line drawn through this point (inner end of N. trench, or N. tangent), to the centre of Pyramid, is at 103° 48′ 27″ to the face of the Pyramid, and is said to be parallel to the axis of the E. N. E. trench, which is at 103° 57′ 34″—a difference equal to 15 inches in the position of the trench end." This angle is complement to the angle of the vertex of the Pyramid, and would seem to stand related to this spot, for the angle of the vertex is 76° 17′ 31.4″, and its complement would be 103° 42′ 28.6″, or 51° 51′ 14.3″ × 2 = 103° 42′ 28.6″.

S. Beswick.

Strathroy, Ontario.

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THE MEASURE AND THE POWER.

THE IMPERIAL BRITISH INCH.

The Imperial British inch is the basis of the two-foot rule; together these are popularly known as the inch and the twenty-four inch gauge. This inch is older than all history and all tradition; indeed there is strong evidence that it took its origin when the Great Architect stretched his measuring line upon *the void.* Its function, with that of the denominations raised on it, is to co-ordinate measures of *space* with those of *time*, and in this last it involves the idea of

LIGHT.

In historic time this inch has had the peculiarity of becoming, in continuous sequence, the property or belonging of *the current leading nationality* of the world.

THE EGYPTIAN OR HEBREW CUBITS.

(*a*) Take the π ratio (John A. Parker) of 20612 : 6561. Taken as inches, then 20612 divided by 1000 gives 20.612 inches, and this was one of *the royal Egyptian cubits.* This cubit value is found in various ways: (1) The French made a great many measures of the rooms, passage ways, etc., of the catacombs of Osymandia. Gustav Seyffarth found a papyrus scroll in which the cubit measures of these rooms were recorded. "By the microscopic tests of Bidone and Plana the Turin cubit (so named because in the Turin Museum), is .523524 of the *metre*" (See Part Seven, p. 151, of Seyffarth's Contributions to the Knowledge of the Literature, Art, Mythology, and History of the Ancient Egyptians). On comparison Prof. Seyffarth found that these French measures answered to the specifications of the scroll in terms of this cubit. (2) The *metre* being 39.37079 B. inches, then this *cubit* was 20.611553 inches long—by trial of Prof. Rogers it is slightly larger, making this cubit some 20.61172 inches long. Thus the restoration of this cubit in British inches, compares with the 20.612 inches of this Parker π ratio, as

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20.61172, showing a difference of .00028 of an inch in this length, or of .000013 shortage in the length of the inch. (3) From independent sources Sir Isaac Newton recovered this cubit as 1.7117 B. feet, or 20.604 inches; and it was this recovery which caused such great value to be assigned to the year 1717 of the Christian era in Great Britain.

(*b*) But if we raise a true proportion on this π ratio, as follfollows: 20612 : 6561 :: 64800 : 20626.4, then dividing this proportion by 1000 we have 20.612 : 6.56 :: 64.8 : 20.6264, where, in the *fourth* term, we find we have recovered another of the *Egyptian royal cubits*, as 20.6264 British inches. The so-called Nilometer cubit was recovered by Mr. Wilkinson as 20.625 British inches.

Thus we have from the peculiar *geometrical* relations of this proportion *a reason for* the origin of these cubits in terms of British inches, clearly showing the correction to be made on the empirical recovery of their lengths. So, also, we have a plain showing as to their relation and interdependence on each other. It will also be observed that the N. cubit, as 206264 *seconds*, is *radius seconds* of the circle of 360 *degrees*.

Upon application of these cubit measures to the various dimensions reported of the rooms, passageways, etc., of the Great Pyramid, especially the N. cubit, it is found that they fit so accurately as to disclose the architectural intention of the designer (See the various articles in this Magazine, by Mr. Charles Latimer and Mr. Dow). So clearly and convincingly is this shown by these gentlemen, that it may be said to be demonstration, and beyond peradventure.

The use of the Turin cubit is especially to be found in the queen's chamber; that of the Nilometer cubit in the king's chamber. Mr. Flinders Petrie finds both of these cubits so closely, and so pointedly, that one would almost be led to suppose that he was well acquainted with the fact of their discovery, and their application in the Pyramid; a quite probable suggestion, as this discovery was made prior to 1875, and has been quite widely published and disseminated.

Thus we may affirm that the Imperial British inch belonged to the Ancient Egyptian nation, the leader of the present

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world's civilization. But it is found that the Hebrews had these identically same measures, and made use of them as the foundation, or substratum, on which to found that religious structure contained in the Sacred Books. Especially is it to be found in these books that the *laws and ordinances* arose out of constructions in masonry. As to this see Jeremiah xliii., 10, 11; xliv., 5; xxxiii., 25; X., 2, 3; also Revelations xxi., 16. The Hebrew nation has been the banner-carrier in the upward and onward march of humanity. It has had the especial office of preserving *unalterably* the letter of the Word of the Law containing the use of these measures.

THE ROMAN FOOT.

But multiply this ratio of 20612:6561 by $\frac{4}{3}$, and this product again by $\frac{4}{3}$.

The first product, as to 20612, gives a basis for finding the exact period of *a siderial lunation*, or 27 d., 7 h., 43′, 3″, 47‴ 20⁗, "the *mean period* which the moon observes through all time."

The second product, as to 20612, gives a basis for finding the exact period of *the mean year*, or 365 d., 5 h., 48′, 50″, 53‴, 6⁗. (See Parker's 'Quadrature,' first edition, pages 117 and 120).

The second product, as to 6561, however, is 11664. This, as inches divided by 1000 gives us $11.^{664}$ inches, and this was the Roman foot.*

Thus in continuous line of sequence we find the Roman nation in possession of this Imperial British inch as lying at the basis of her foot measure; and, indeed, she was the successor of the dominating power in the world. It is to be observed that the measure of her adoption is derived from the same π ratio with the Egyptians and the Hebrews.

In calling attention to this it is very interesting and instructive to connect this origin with the following ratio of 20612:6561 :: 64800: $20626.^{47}$ already given. Raise this proportion by multiplying it twice by $\frac{4}{3}$. While all that has been said above will make its appearance we shall have a further extension, in the

* See recovery of this measure as $11.^{664}$ British inches by Prof. Greaves, as noticed in 'The Great Pyramid' by John Taylor, page 24, *et seq.*

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fourth term, of a product of 36669.^{280031}+ inches, or 3055.^{773} feet. The ¼ of this is 763.^{943} feet or 9167.^{320} inches, or, as per Howard Vyse, *the base side length*, between sockets of the Great Pyramid.

He gives this measure as 9168 inches. From the half of this base side length *deduct* its one-tenth, and there will remain 4125.^{294} inches, or the length of the descending passage way, which Col. Vyse gives as "about 4126 inches."

THE IMPERIAL BRITISH INCH AND THE DENOMINATIONS RAISED ON IT.

Succeeding the *Roman Nation* as the one, and only one, having a predominating power over the world's progress, is the *English speaking race*. And here, as belonging to Great Britain, we find not only this inch as the standard unit, but also a series of denominations of measures, as the *foot*, the *fathom*, the *yard* and the *mile*. Here seems to be the perfection of that system of measures made use of in primeval times to *interpret* the cubit construction of the Great Pyramid. For we find all these measures orderly placed in that work; and that so as to work out a series of co-ordinating *time measures*.

Whether there is Fate and Destiny, or better, a Divine Providential care in thus connecting this origin and system of measures with the world's successive controlling powers, is a matter open to the speculation of those who may be pleased to go further in the matter than the bare recital of the facts. The latter is the only purpose of this contribution.

J. R. SKINNER.

NOTE.—It may be noticed as to the Hebrews and the Egyptians that they seem to have been from a common Semitic stock Either was in possession of these measures, without priority, both having them from a common race stock or root.

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CORRELATION OF ANGLO-SAXON MEASURES.

It has been demonstrated beyond reasonable questioning that Egypt, the most learned, most religious and most ancient seat of civilization, had a metrology founded upon correct knowledge of geometry and astronomy. How that knowledge was obtained we perhaps cannot say. That it belonged to the Great Pyramid builder is most certain. That the metrology there used was substantially what we use to-day may, we think, be proved to a very high degree of probability, if not mathematically and physically demonstrated.

But it more immediately concerns us to know what actual relation our metrology bears to the natural standard of measure? What correlation exists between our system and the nature, form and movement of the earth? So far as Pyramid discoveries go to establish true relationship between nature and Anglo-Saxon metrology, they are of value to our present investigation. To indicate somewhat the scope of our inquiry we begin with the following proposition, using Anglo-Saxon measures throughout.

PROPOSITION I.

If the number of degrees in a circle be divided by the number of hours in a day, and the quotient be multiplied by the number of feet in a mile, the result would be, in miles, ten times the earth's diameter at the Great Pyramid, that is, $\frac{360}{24} \times 5280 = 79200$.

Proof.—The longest equatorial diameter is 41852.864 feet (Clarke) which is in E longitude 14° 23′. In the longitude of Paris, which is not so far east by 12° 3′, the equatorial diameter ls 41852.695 feet. Hence the diameter at the equator decreases 14 feet for 1° of longitude. The Pyramid is nearly 17° from the longitude of the greatest equatorial diameter, therefore, the equatorial diameter at the longitude of the Pyramid is $41852.864 - 17 \times 14 = 41852.626$. The diameter of the earth at latitude 30° is .99917 of the diameter at the equator on the

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same meridian. Hence the earth's diameter at the Pyramid is 418526.626×.99917=41817.888 feet=7920.04 miles. In this first proposition are correlated by integral numbers, circular measure, time measure, linear measure and the diameter of the earth at the Pyramid.

PROPOSITION II.

The correlation of circular measure, time measure, linear measure and the latitude of the Pyramid is evidenced in the base lines of the Pyramid.

Proof.—One minute (1′) of longitude at the latitude of the Pyramid is 5280 feet.† This gives a parallel of latitude= 114048000 feet. The $\frac{1}{1000}$ part of the diameter of this circle is 36302.604 feet. The one-fourth part of the latter is equal to 9075.651 feet; laid out on the scale of 1 inch to a foot it is 9075.651 inches, that is $\frac{5280\times 21600}{4\times\pi\times 1000}$ = base side on pavement=9075.651 inches, or 440 cubits (20.62648). Mr. Petrie's computations from casing stones found on the pavement near the middle of each side, without any allowance for wear or form or finish is 9069.4 and 9069.5 for the N. and S. sides respectively. Forty inches lower than the level of the pavement is the level of the lowest (S. E.) corner socket. The N. E. corner socket is 11.4 higher than the S. E. and 9131 inches distant from it. It is conceded that the sockets are in the slope of the corners. It is also conceded that the angle of slope of the face sides is 51° 51′ 14″ nearly. At this angle of slope the N. face carried down to the level of the S. E. socket will give a *geometric* base side of 9131+8.8+=9139.8+. The difference between this geometric base side and the pavement base side is 9139.8—9075.6=64.2. One-half of this or 32.1 will be the horizontal distance inwardly that the face would extend in rising up from the geometric or S. E. socket level to the pavement base, and 32.1÷.7854 will give the difference between the levels of the two bases. It is 40.8 inches. Mr. Petrie, from actual survey computed the S. E. socket at 40. inches be-

†Prof. Stockwell computes it at 5277.7. Other computations make it a little more. It is certain that the 1′ mile longitude is within convenient sighting distance of the Pyramid for a survey.

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low the pavement. The difference of .8 between his survey and our correlation may arise from a slight change of levels in the past 4000 years. The displacements found in the interior certainly indicate that such a change is not only possible but probable.

The correlation goes beyond this. Heretofore we have demonstrated that the geometrical, not the pavement base side, is one ten-millionth of the best obtained computation of the earth's polar radius, multiplied by the number of days in the tropical year. We now proceed to a minute examination of the orientation of the Pyramid in terms of Anglo-Saxon metrology. It will be observed that by no other system of metrology is such a correlation possible.

Mr. Petrie's agrees with other surveys of the orientation of the Pyramid. It stands about 4′ west of north. The azimuth of the S. E. to N. W. diagonal, computed by Mr. Petrie from the outer corners of the socket, is 45° 4′ 13″±6″. There is no more accurately defined line in the entire structure. A square with this line for its diagonal, would have an azimuth 4′ 13″± 6″ W. of N. What does this azimuth signify, and how was it obtained? In a most valuable memoir on the secular variations of the eight principal planets, prepared by Prof. John N. Stockwell, and issued by the Smithsonian Institute in 1872, a a table of precession of the equinoxes is computed for a period of 16000 years. Forty centuries ago the annual precession was 49.406″. In five years it amounted to 4′ 7″, a very considerable angle and subject to accurate measurement. Neither four nor six year's precession will approximate 4′ 7″. Nor will five years' precession give this azimuth, outside of the 22d century B. C. The inference, therefore, that the azimuth of the N.W.-S.E. diagonal was the result of actual observations for a period of five years, to obtain the precession of the equinoxes, appears to be reasonable. Certainly the azimuth agrees with the astronomical fact, and if it was designed to read the precession, it reads the date of the Pyramid. The annual precession of the equinox 2170 B. C. ×5=azimuth of Pyramid.

Mr. Petrie tells us that there was an uncertainty in his determination of the socket sides averaging .65 inch on each side.

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We may fairly infer on account of weather wear or abraisure of the sockets that this possible error of 6″ should be deducted from his measures rather than added to them. In that case his 4′, 13″, ± 6″ would become 4′, 7″.

This appears to be reasonable evidence that the N. W.-S. E. diagonal, by its azimuth, records the equinoctial precession. Is the precessional period as computed from the observations of the 22d century B. C., also recorded? This period Prof. Stockwell computes at an average of 25694.8 years, with a variation less or greater by 2812 years. Four thousand years ago the tropical year was 248 seconds longer than its mean period—that is, its actual length in the 20th century B. C., in mean solar days, was 365.242549. One-fourth of 100 such days is 9131.0637.

(3) $\frac{\text{The tropical year 2170 B. C.} \times 100}{4} =$ east socket base side (inches).

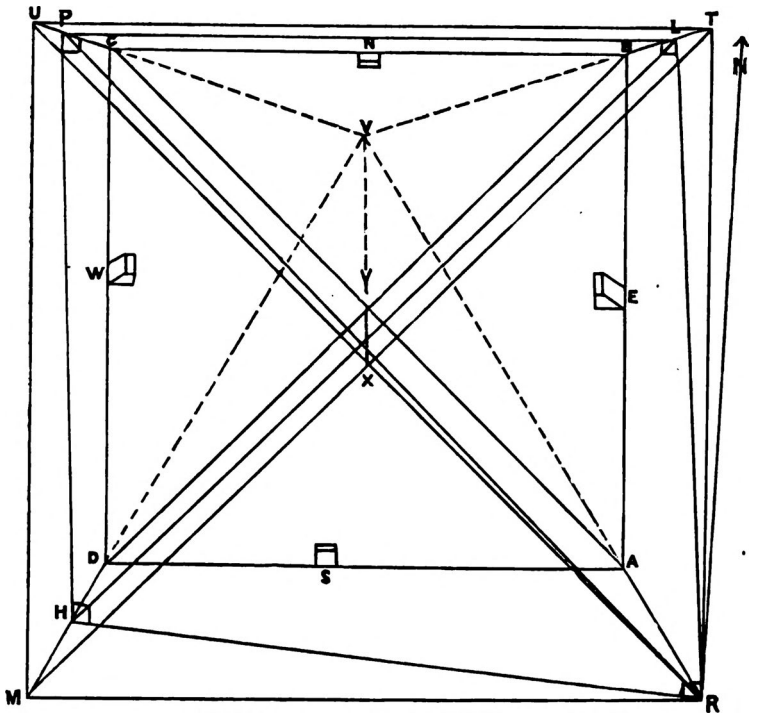
From Prof. Stockwell's table of the variations in the eccentricity of the earth's orbit we find that the eccentricity 2170 B. C. was .0182274. Multiply this by $\frac{1}{1000}$ of the earth's polar axis and we have 9122.8 +.

(4) $\frac{\text{Eccentricity of earth's orbit 2170 B. C.} \times \text{polar axis}}{1000} =$ north socket side (inches). Take now a square having a side = to 9139.8 + inches, and with one corner resting in the S. E. socket let its diagonal pass through the corner of the N. W. socket. On this diagonal as a base, and with formula (4) for the north side and formula (3) for the east side, construct a triangle with its apex in the N. E.-S. W. diagonal and the N. E. vertex of the triangle will rest on the N. E.-S. W. diagonal. By this construction we can obtain the value of the base of the triangle. It is 12914.136. This same line obtained from Mr. Petrie's survey is 12914.292. The difference between the surveyed line and the line resulting from our correlation is ⅛ of an inch in nearly 13000 inches. The double of this line is 25828.272, or 134 in excess of Prof. Stockwell's computation for the mean precessional period—that is, it is nearly half way between the mean value of that period and its greater extreme.

We do not doubt that the ancients had some accurate methods

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of astronomical observation and computation. And we suggest that the trenches and basalt pavement on the east side of the Pyramid were constructed in order to make such observations from which to build the monument and also to lay it out by their own methods of civil engineering.



In all this there may have been no need of extraordinary or supernatural revelation. Men could take the measure of the earth and observe the passage of stars then as well as, or, perhaps, better than, now; and if they recorded any astronomical facts or events in the structural form and proportions of the Pyramid they did not accidentally, or for mere building convenience, make the levels of the corners differ from 7 to 17 or 20 inches. We submit that some of the old civilizations may yet prove sound instructors to the new. It is much as Dr. Mait-

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land said of the middle ages, we call them the Dark Ages because we are very much in the dark about them.

In conclusion we wish to note how mathematically beautiful is the correlation of a portion of Anglo-Saxon metrology. Take first the length of a pendulum beating seconds at the Pyramid, it is 39.0625 inches, or $5^8 \div 10000$. Next take 10000 cubits (20.6264), it is the radius of a circle in which 1″ of arc equals 1 inch, and 15 inches equal 1 second of time. Once more take the mile, 5280 feet of linear measure, it is 3072 cubits (20.625), therefore the radius of a circle having a circumference equal to 1 mile to 1′ is 880000 cubits (20.625), and 880 cubits is the radius of a circle having a circumference of 114048 inches or 9504 feet. Thus the cubit bears to circular and linear measure the like relation that the modern π bears, for it is derived directly from the circle in which 1″ of arc = 1 inch, the circumference being 1296000, $\frac{1}{10000}$ of the radius is 20.626 +. The small difference of .001 + between the two cubits of 20.6264 and 20.625 being necessary for a convenient and practical correlation of the linear mile with circular and time metrology.

H. G. Wood.

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FLINDERS PETRIE'S WORK AT THE GREAT PYRAMID.

(1) He professes to have obtained the distance between sockets and the base line of the Pyramid proper by triangulation.

From this:

"Therefore, when reducing my observations, after the first winter, I found that the casing on the north side (the only site then known) lay about 30 inches inside the line joining the sockets, I searched again and again for any flaw in the calculation. But there were check measures, beside the regular triangulation, which agreed in the same story; another clue, however, explained it, as we shall see" (p. 37).

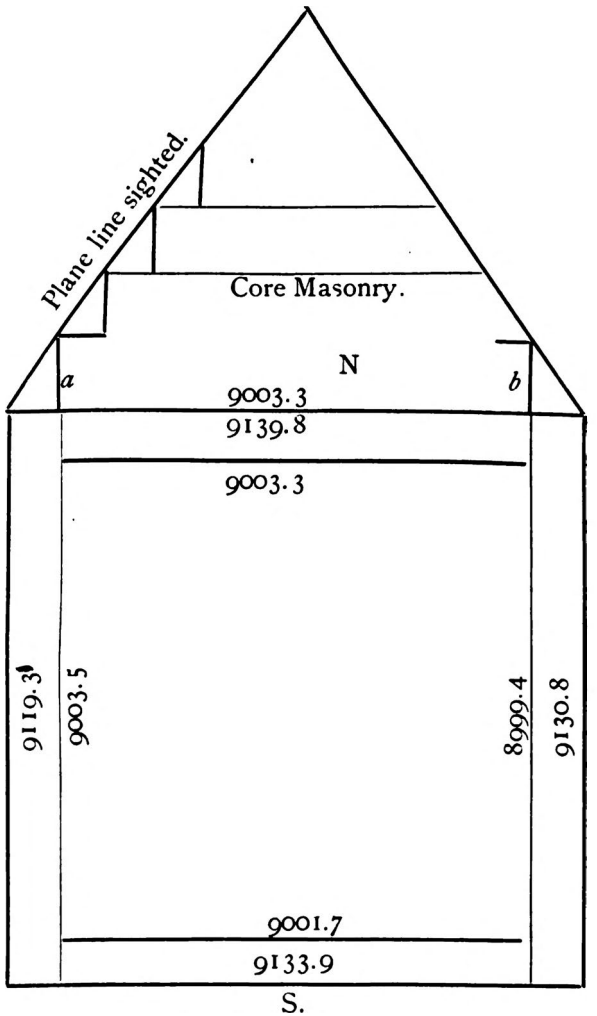
This clue professes to be as follows:

"The form of the present rough core masonry of the Pryamid is capable of being very closely estimated. By looking across a face of the Pyramid, either up on edge, across the middle of the face, or even along near the base, the mean optical plane which would touch the most prominent points of all the stones, may be found with an average variation at different times of only 1.0 inch. I therefore carefully fixed, by nine observations at each corner of each face, where the mean plane of each face would fall on the socket floors. On reducing these observations to give the mean form of the core planes at the pavement level, it came out thus:

Case plane sides,	N.	9003.3	inches.
	E.	8999.4	"
	S.	9001.7	"
	W.	9003.5	"
Mean,		9001.5	"
Socket Sides,	N.	9139.8	"
	E.	9130.8	"
	S.	9133.9	"
	W.	9119.3	"
Mean,		9125.9	"

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A section showing this for N. side is here given.

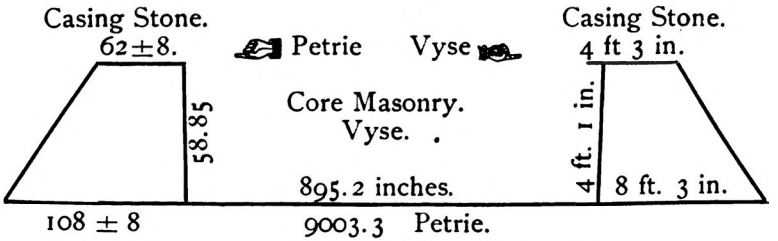


Mr. Petrie plainly says this is the result on the measure of the Core Masonry.

Davidson, the French and Colonel Vyse make the line *a b* to be 746 feet = 8952. inches As above 9003.3 inches; difference 51.3 inches.

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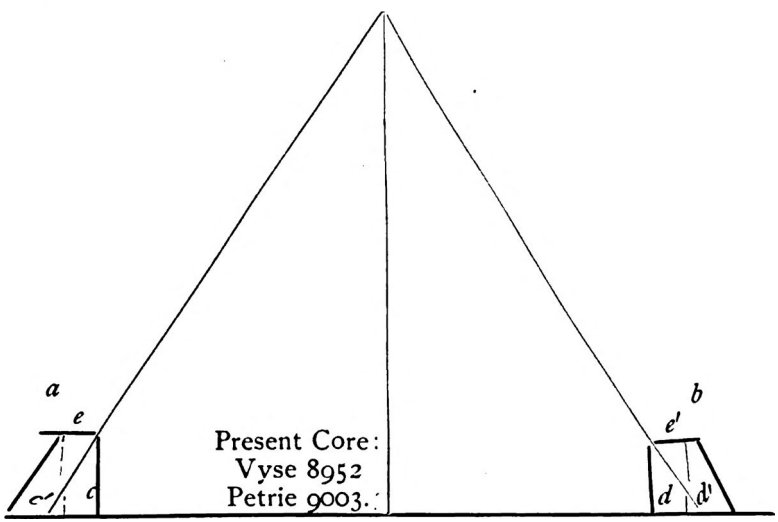
The following shows the relation of the casing stones to the core masonry by Petrie and by Vyse:



By this the base side by Vyse would be $8952 + 198 = 9150$ inches. By Petrie, $9003.3 + 200 = 9203.3$ inches.

But as Petrie makes the entrance length of sides restored by casing stone to be 9139.8, it is evident he has made an error of statement with regard to the core masonry or 9003.3. That is, it cannot be the present core masonry, because he says expressly that the casing stones have a thickness of 108±8, or say 100 inches each, to conform to Vyse.

To show how he made this error:



a and *b* are the casing stones to be replaced on the *core masonry* to complete the base side.

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Now Petrie by his sight line takes the measure c *only*, whereas the true addition is c or c′ *plus* the thickness of the flat top e or e′, and this is 51 inches by Vyse, and 62 — 8 by Petrie, or say 54 inches. Petrie was following Vyse, as most of his measures show.

Take Vyse's measure of the present core masonry or 8952 inches. Add the top thickness of the casing stone or 51 inches to complete the extension of the core masonry, and we have 8952 + 51 = 9003, or Petrie's measure of the core masonry. Petrie undoubtedly took this process, which prepared him for his sight line, to obtain the addition of the extra thickness of the casing stone as c or c′. But his error was in omitting to add the length of the top thickness of the casing stone *once again*, for the opposite side of the Pyramid. And this would give for the core *masonry restored*

$$8952 + 51 = 9003.0 + 51 = 9054 \textit{ in.},$$

to which he should then add as resulting from the sight lines, the extra distances c or c′ and d or d′ or together some 49 × 2 = 98 inches, making 9054 × 98 = 9152 *inches.*

It is easy to see how his error took place, but it is almost incredible how he came to make it, for the consequences are disastrous to his ideas as to the descending passage way.

For on the corrected extension the nineteenth course of masonry would be so far extended out horizontally that to have the descending passage way terminate in it at the proper intersection he would not only have to extend its length far beyond a limit of credibility but, moreover, because of his fixing the height of the existing basement sheet at some 611.2 inches above the level of the pavement, the intersection of the descending passage way with masonry course 19 would take place far within the outer surface of the sloping side of the restored Pyramid.

Vyse gives core side as 8952 inches—thickness of casing stone or bottom 99 inches; but distance measured between sockets on N. base side 764 feet, or 9168 inches, making for the casing thickness 9168 — 8952 = $\frac{216}{2}$ = 108 *inches each*, in place of 99 as he gives it—and this shows that Petrie was following him as he gives the thickness of the casing stone as 108 inches.

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It is possible there was a backing course between the casing stone and the masonry core, of some 9 inches, which would account for this feature.

In some respects Mr. Petrie has done some good work, verifying and comparing the measures of those preceding him.

N. B.—Take it that Mr. Petrie's 9003 was derived from Vyse's 8952, to which the casing stones were to be added by his and Petrie's measures.

$8952 + 62 + 62 = 9076 + 46 + 46 = 9168$, or just Vyse's measure.

Here again he adopted Vyse's measure of top of casing as 4 feet 3 inches, or 51 inches, which added to $8951 = 9003$. whereas he found the casing stone to be on top 62 inches and on bottom to be 108 inches; and with this correction his restored masonry course should have been $8952 + 62 = 9014$ (in place of 9003), and 62 to this would make for restored masonry course $9014 + 62 = 9076$ inches, and then his sight line plane would give him $46 \times 2 = 92$ to be added, making $9076 + 92 = 9168$ inches.

Now Petrie works out his core masonry again in which he makes that of N. side $= 9012$ in place of 9003, which shows that he was making this very correction.

But see "Plate X" work for N. side:

Total length of base side,	9129.8
Deduct $22.4 + 25.7 = 48.1$,	48.1
	9081.7
Deduct $39.4 + 27.7 = 67.1$,	67.1
For core masonry!!!	9014.6 inches!!!

Which proves what is said as to 9014 inches on last page!!!

Thus in fact Petrie is confirming the measures of Howard Vyse, viz: 9168 inches.

April 8, 1884. J. R. SKINNER.

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DOW'S NEW FORMULA, (P. 240).

Mr. Dow's new formula for the height of the wall in the king's room is neat and beautiful, and as simple as it is beautiful. But it is not altogether new, for Petrie has referred to it and used the formula itself, and got a very near approximation as the result. Mr. Dow's formula is $648 - \frac{1296}{\pi} = 235.470388$. And the circle has 206.2648 for radius, and $\frac{1296}{\pi} = 412.529612$ for diameter. Petrie, referring to the formula for obtaining the height of the king's room, says: "The only other theory of the height of the walls is similar to one of the best theories of the outside of the Pyramid; it asserts that, taking the circuit of the N. or S. wall, that will be equal to the circumference of a circle whose *radius is the breadth of the chamber*, or whose diameter is the length of those walls. Now, by the mean original dimensions of the chamber, the side walls are 412.25 long, and the ends 206.13, exactly half the amount. Taking, then, either of these as the basis of a diameter or *radius of a circle*, the *wall height*, if the sides are the circumference of such circle, will be $235.32 \pm .10$. This theory leaves nothing to be desired, therefore, on the score of accuracy."

The formula is the same in *principle* as Mr. Dow gives on p. 240, and embodied in the diagram, but the numbers used are slightly different. If Petrie had used Mr. Dow's number—206.2648—instead of 206.13, he would have got out the same height as Mr. Dow—235.470388 instead of $235.32 \pm .10$. The principle of the formula is really not new, for Petrie speaks of it "as one of the best theories" (p. 190) then known. But Mr. Dow has made it new by bringing it into the group as an outgrowth of the analytical unit, and thereby fixed the true value of the factors used in the calculation.

Perhaps I might suggest an addition to this analytical group, which will bring out the analytical value of the diagonal to the perimeter of the Pyramid's base.

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If the solid diagonal of the king's room be $\frac{1620}{\pi} = 515.662016$

And the height of Pyramid be $\frac{32400}{\pi\sqrt{\pi}} = 5818.622870$

And the side of Base be $\frac{16200}{\sqrt{\pi}} = 9139.871258$

Then the following will also be true:

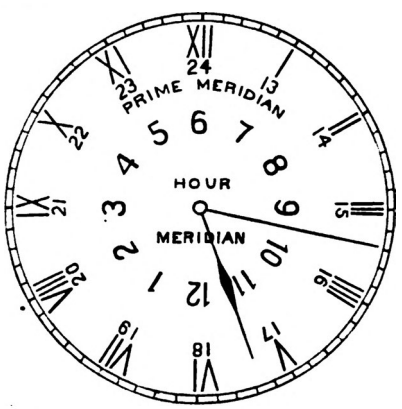
Diagonal of perimeter $\sqrt{\frac{16200^2}{\pi} \times 2} = 12925.7312$

SAMUEL BESWICK.

Strathroy, Ontario, Canada.

PRIME MERIDIAN TIME.

The following simple device is an easy and ready way to adjust hour-meridian or "standard time" to prime-meridian time. No change of the machinery of our time-pieces is required by this method, and no additional hand is necessary. Let the hour numbers 1, 2, 3, &c., to 12 be put on the crystal inside, as shown in the cut.



The crystal being moveable, it becomes an adjustable dial which may be set 1, 2, or 3, &c., hours fast or slow of the fixed or common dial. Next let the fixed or common dial be used

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for prime-meridian time. Adjust the crystal dial according to the number of hours you are from the prime-meridian, and it will show the local "standard time." Suppose Greenwich time be adopted for prime-meridian. Set the hands to Greenwich time. Now if we are using the 90th meridian, "standard time," it being six hours slow of Greenwich time, set the crystal dial with fig. (12) to correspond with (VI) of the fixed dial. It is so adjusted in the cut, which shows that when it is V o'clock and 17 minutes by Greenwich time it is 11 (eleven) o'clock and 17 minutes by "standard time" at the 90th meridian. A traveler carrying a watch thus provided with the hours marked on the crystal could change from New Orleans the 90th meridian, to Philadelphia, the 75th meridian, by turning the crystal (12) back from VI to V without disturbing the hands.

By this arrangement all the railroads of the country could run on one standard meridian, and their schedules would agree with the hours marked i, iii, iii, iiii, v, &c., of the fixed dial, while the local time for any hour meridian would agree with the hours marked 1, 2, 3, &c., on the crystal dial. It is desirable that the dial for railroad use be immovable, on account of safety. Therefore the fixed dial is here used for prime-meridian time. Another advantage of this arrangement is that the minutes are read as we commonly read them from XII, the uppermost point of the dial, around to the right. The hours on the fixed dial can be continued, as shown in the cut, to 24 o'clock, while on the crystal dial they are, as now in use, from 1 to 12. Persons using watches thus arranged would, in case of the adoption of one meridian for railroad schedule time, look to the outside hours for railroad time, and to the inside hours for local time.

H. G. Wood.

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PROF. BARNARD'S BOOK.

The object of Prof. Barnard's book is evidently to bring discredit upon the Great Pyramid, and ridicule upon those who, having some respect for their Bible and the prophecies, believe that this Pyramid is "the altar and pillar of witness to the Lord of Hosts" referred to by the Prophet Isaiah; but which he, the "very reverend President Barnard," as you style him, with sublime indifference to the sacred writings and to the feelings of thousands of earnest, intelligent Christians, designates as a "stupendous monument of folly," a "huge and senseless pile." But if it is nothing more than this why should a person in his position waste his valuable time and talents in writing an elaborate book about it? Evidently because he finds that the great bulk of the Anglo-Saxon races cannot be induced to commit the folly of giving up their ancient, convenient and useful system of weights and measures for the cumbrous and pretentious French metrical system while this "huge and senseless pile" stands in the way. This metrical system may serve the purposes of a a few scientific men, but it is wholly unsuitable for the general everyday requirements of the great majority of the people whose conveniencies ought not to be sacrificed to the fancies of a few scientific men, however eminent as scientific men they may be.

Prof. Barnard complains of the action of the opponents of the metrical system as "a crusade against the spirit of progress of the age;" but will he venture to deny that the nations which still use the weights and measures which he condemns have made far greater progress in religion, politics, commerce, art, science and wealth, than all the nations which have for so many years been using the belauded metric system? The violence of his attack upon the poor Pyramid, and the bitter and contemptuous language he uses in speaking of those whose opinions differ from his own, betray a consciousness that the effect of his great efforts will, after all, only "about equal that pro-

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duced by the honest old lady who attempted to sweep back the rising tide of the Atlantic with a broom."

As the very able paper by the Rev. H. G. Wood, in the January number of the STANDARD, has already taken most of the ground from under the Professor's feet, I will at present only refer to what he has said about the sun's distance. The Pyramid sun distance he describes as "a fact which, to plain human reason and simple common sense, is so grotesquely improbable that its possibility can only be defended by clothing it with the character of miracle;" he then gives the several astronomical determinations which have been arrived at since 1862—thus:

Leverrier	91,357,000	miles.
Chambers	91,465,000	"
Newcomb	92,200,000 to 92,700,000	" "
Young	92,885,000	"
Michelson	92,876,000	"

He then states that "the distance of the sun, as worked out on the Pyramid theory, is 91,837,000 miles," and concludes by remarking that "the Pyramid distance is, therefore, only about a million of miles too short; while probably the uncertainty which still attaches to scientific deductions is not so great as half a million." How he could venture to make such a statement in the face of the figures he quotes I cannot understand, seeing that the extreme astronomical values differ no less than 1,528,000 miles, while the difference between the Pyramid distance and the mean of all the astronomical distances is only 410,000 miles. Surely he must have formed a very low estimate of the intelligence of his readers if he expects that they will be influenced by such reasoning and statements as he has here employed. To show further how little his statements and opinions are to be be relied upon, I may remark that since his book was published the first result of the last transit of Venus has been published by the eminent director of the Brussels Royal Observatory, M. Houzeau, and it gives the sun's distance =91,756,800 miles, or 80,200 miles *less* than the Pyramid distance, which Prof. Barnard says is "only about a million of miles too short!" Pyramidists, therefore, need not feel discouraged

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or fear that Prof. Barnard's violent but ill-directed attacks will endanger the Pyramid sun distance, or the British inch, yard, and mile.

May I be allowed to ask Prof. Barnard whether the great conveniences for the everyday business of trade and commerce, of the British system of weights and measures over all other systems in use, may not have had something to do with the making of the Anglo–Saxon races by far the richest in the world, and enabling Great Britain to lend money to many nations, and borrow from none? Certainly it has been no check or hindrance to a progress which is a marvel to the whole world.

With respect to the question of a prime meridian, I shall prefer Greenwich, simply because it is far more generally referred to at the present time than any other, and that the great bulk of the world's traffic is carried on in vessels which use it as their zero of longitude.

Jos. BAXENDELL.

EXTRACT FROM A PAPER BY JACOB M. CLARK.

READ AT A MEETING OF THE NEW YORK AND NEW JERSEY AUXILIARY SOCIETY, AT COOPER UNION, NEW YORK, WEDNESDAY, JULY 9TH, 1884.

The early germination of geometrical ideas, in the advance of mankind from savagery towards refinement, is well illustrated by the gorgets and other ornamental relics of certain tribes of western Indians, recovered in part from the ancient mounds, and figured in the second Annual of the Bureau of Ethnology, reported by Prof. Powell. They suggest themselves as having formed parts of the regalia of priests or initiated men; and exhibit in various combinations of detail, but with considerable persistence of typical expression, the cross in the circle, the square, the division of the circle by three, six, eight, twelve, etc., combined with signs which suggest circular motion and the flight and division of time. Many of them must be calendars; but, any way, they connect typically with Aztec and Egyptian monuments. If these things do not establish ethno-

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logical affinity of these tribes with the Mound Builders, the Toltecs, the Peruvians, or with the pre-historic civilized peoples of the Eastern world, they at least indicate the germ of geometrical and astronomical conceptions, and go a long way towards verifying the doctrine maintained by Alexander Von Humboldt, the *identity of the human mind.*

And it is a most gratifying circumstance that we can now note everywhere a marked and growing tendency among writers on metrics—nowhere more apparent than among the members of our own Society—to insist upon *unity* and *simplicity* of conception throughout. And freely as we may concede that the French system was an outcome of this very tendency, yet it fell far short of the ancient systems, both as to its approach towards perfection in circular division, and in actual convenience. Take for instance the Persian system. The parasang was $\frac{1}{6000}$ part of the terrestrial circumference; and the $\frac{1}{10000}$ of this, about $26\frac{74}{100}$ inches, is now represented by the pic of the Turkish dependencies, and survives to this day in Persia. Compare this, as to convenience of length, with the French metre. Similar comparisons, with the same effect, might be made as to several other very ancient systems.

Our present nomenclature for the expression of mechanical energy or its effect—by such terms as horse-power, foot-pound, and, in French, kilogramme-metre, etc.—is exceedingly defective, and requires immediate and thorough revision. The terms are not based on a simple and obvious correlation between the units of ordinary measurement and the modes and conditions under which applied force produces its effects, and therefore of themselves convey no very clear idea to the popular mind. Their application in practice—nay, their intelligent apprehension even—requires previous special study, and, to some extent, the training of an engineer.

And it is passing strange that the agency we call *electricity*, whose recent past development surpasses the wildest dreams, and which promises possibilities for useful effect in the near future of which the most visionary can form but a feeble conception, should have been saddled as to its practical use with a new nomenclature and technology throughout, totally

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disconnected from all other systems and from all its obvious correlations, and with purely arbitrary names, to serve as monuments of wind to some distinguished men. And it seems to us little short of infatuation that the British Association should have adopted such a manner of expression, based on the one hand upon the French system of metrics, and upon the current mode of reckoning time on the other! To one who has not made the subject a special study, the whole is unintelligible, in fact, "heathen Greek."

DEATH OF THE ABBÉ F. MOIGNO.

It is with extreme regret that we announce in the present number of the magazine the death of our most esteemed and excellent member, the Abbè Moigno, of Paris, France. We feel the death of this great and good man as a most serious loss to our Society, for he was a champion of the weights and measures of the race, a full believer in the divine inspiration of the Great Pyramid, an earnest student and co-worker with us against the French metre even in his own country and against many of his own people, boldly daring to stand up for the right and denouncing the false measure as a device of the wicked. Nothing shows more fully how the barriers of prejudice are thrown down by our work than the union of this great man with our Society. Here was a Roman Catholic priest, earnest in his devotion to his church, and yet when he had studied the truths of the Great Pyramid all prejudice touching the question of Protestantism and Roman Catholicism vanished away and he was with us as a brother working in the discussion and dissemination of the truth and wisdom contained in the Pyramid of Jeezeh, as a monument of science and religion upon which all mankind could unite and come together.

He was elected a member of our Society, and upon the announcement of his election accepted it and declared himself to be a co-worker with us publicly, and published it in the *Cosmos Les Mondes*, a noted scientific journal, of which he was the editor

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and founder. We were well aware that in taking this step he must suffer persecution ; and how far this went we cannot tell now, but we know that he was ousted from the directorship of the *Cosmos Les Mondes*, his own paper, and was informed that he would be attacked for having taken up the defense of the Anglo-Saxon measures against the French metre. We know from a letter written in his last moments that this was a trouble and grief to him. We feel his loss greatly, but in the dispensations of Providence he may speak louder in his death than in his life. On the 7th day of June, only three days before he died, he penned us a letter in English, written evidently with great difficulty, and said that he was not very well. He spoke of the bringing out of his last great work, the translation of 'Our Inheritance in the Great Pyramid' ; and nearly his closing lines expressed a hope for the success of the expedition to Egypt, and signed himself, "Your very old, but firm and devoted leader, the Abbé Moigno, Canon of St. Denis."

Three days after writing this letter the following appeared about him in a Paris paper :

A truly wise man and a true Christian, the Abbé Francois Moigno, Canon of the Second Order of the Chapter of St. Denis, passed to his rest from his domicile No. 2 Rue Strasburg, at the age of eighty-one.

He was born in 1804 at Guemené (Morbian), son of a gentleman of Brittany, Moigno de Villebeau, who abandoned his title of nobility in the Revolution, having joined the order of Jesuits. He retired from it in 1844 because the publication of his 'Lessons upon Differential and Integral Calculus' was opposed by the superior of the order of the Jesuits. The Abbé Moigno preferred to go out of the order rather than to renounce his independence in his favorite studies. He was a laborer upon a number of Paris papers, and eventually established a journal, the *Cosmos*, which he afterwards joined to a paper, *Les Mondes*, under the title of the *Cosmos Les Mondes*. He was a friend of Ampère, Arago, Binet, Beaudant, Thinard, Humboldt and Dumas. He had a prodigious memory, and spoke with fluency twelve languages.

He held many important positions of trust, and in 1873 was named Canon of the Chapter of St. Denis. He was chevalier of the Legion of Honor.

Among his important publications we may cite the treatise on the electric telegraph, a work on modern optics, a course of vulgar science, a work on physics and chemistry, and above all his great work upon the "Splendors of the Faith."

Having traveled over all countries of Europe, he preserved relations with all the wise men of the world.

Like most great men and writers he made no fortune, and his pension joined to his canonical position was his only means of existence.

We mourn his loss.

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THE UNVEILING OF ISIS.

In the previous pages upon my subject I have confined myself to the historical, principally, in order to prepare my readers for the unfolding of the interior meaning.

Let it be borne in mind that the investigation into the subject of metrology is an inquiry into the origin of race and language, science and religion, and hence it has the highest and deepest, the widest and broadest significance of any subject under the sun. And since I must present in this discussion new thoughts and theories which will be considered unorthodox by some, and will be looked upon as the resurrection of so-called superstition by others, I can but repeat the prayer of my heart, uttered and re-uttered, "Oh Lord, if in my ignorance I should teach anything which is contrary to that which is eternal truth, forgive and overrule and bring to naught; but if all, or even any part shall be the truth, then may it sink deep into the hearts of the people." I believe I have the truth; as such I put it forth with confidence as worthy of the investigation of, and reception by, the people. It is only through the plain narrative of my story as it came to me that it will be understood and appreciated by them.

For years the vision of the woman clothed with the sun represented itself to me as a symbol of our banner, and I never could disassociate the three men whom I have characterized as the representatives of three saints or the Magi from the vision: Mr. Baldwin had declared that the crown of twelve stars represented the twelve States of the Union, but how could this be reconciled beyond the mere ideal? The analogy was not sufficiently strong to accept it as truth unless there should come some plain, tangible proof of a different kind. For this I sought earnestly, but the knowledge came only in years of thought as my mind from time to time would revert to the subject.

To fully unfold the steps by which I became acquainted with

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and acquired a knowledge of all that I have gleaned since the presentation of the historical sketch which I have just finished would take a volume, and it may not be within the province of this Magazine to extend the explanation of my subject through so many numbers as it would require. It is only for me now to narrate as succinctly as possible the circumstances which led me to present this subject as 'The Unveiling of Isis,' and leave the details and the explanations and the proofs which are absolutely necessary to convince the general reader of the truth of what I present to a more extended work hereafter, or sketches from time to time in the Magazine itself as it may seem best. As far as the interior meaning of the subject had come to me in the spring of the year 1875, I had in my mind a vision—the vision of Saint John, in the first verse of the twelfth chapter of Revelation—three men standing the representatives of the grandest epochs of human history. The woman represented the church, the sun the greater civil power, the moon a civil power, the stars a civil power. And in seeking for a representative woman who would most fully fulfil in womanly beauty and character and position this symbol of the church, an ideal queen, Isabella of Spain, arose in my mind; and searching history I found these words by distinguished men: "By Isabella was accomplished the grand event of European policy, the expulsion of the Crescent; and through Isabella the most prodigious event of humanity, that which doubled its terrestial domain." Again, "It seems as if Heaven had raised her up for two purposes—the overthrow of the Crescent and the discovery of the New World." (Spanish History.) And, again, the words of Bishop Arevalo, "Without reservation I declare that Nature has never produced, and that Providence has never crowned with a diadem, a woman who can compare to Isabella, the Catholic." And, again, this, "In the worlds of our planetary system the sun never clothed or illumined her equal." (Cardinal Ximenes.)

Our greatest commentators have said that when they wanted to find the fulfilment of a prophecy, they looked around in contemporaneous history for the words of the great writers, either in their books or in the newspapers of the day. Here

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was the sun symbol presented to our imagination, the woman clothed with the sun, a crown of twelve stars above her head, and the moon under her feet, and without ever having a thought of the words of these men, but selecting that queen, who was, in my opinion, the very ideal of grandeur, to represent a church, I selected Isabella. I had taken the sun as the great civil power of the world, and the Crescent—that is, the Mohammedan power —under the feet of this very woman whose whole soul was animated with a determination to drive out this power from the domains of Spain; in a larger sense she represented Christendom; the Crescent was under the feet of Christendom, and, as a constellation, there arose in the dim future a vision of that government in the New World, the diadem of that woman's sagacity, and piety and self-sacrifice. She built a city in the form of a cross and called it, "The City of the Holy Cross," besieged the city of Grenada, the stronghold of the power of the Crescent, until on January 6th, 1492, on the day of the Epiphany, the feast of the kings of the Magi, she marched in and took possession, and drove out the Moors, occupied the Alhambra and hoisted the Silver Cross of the Crusaders above the Crescent on the top of the tower of Camaris. And thus was fulfilled the symbol of the moon of the Mohammedan power being under the feet of Christendom. She had said that until the great work of the expulsion of the Moors was accomplished she would not commission Columbus to go forth in search of the New World, but when her object was achieved she sought in every direction for means to assist him, and was ready to even pawn the Crown jewels, when a man by the name of Saint Angel came to her and offered her the money.

As I said before I could not disassociate from this symbol the grand figures of Columbus, Luther and Washington, and they always were present to my mind with the symbol of the sun-clothed woman above their heads in the heavens. The symbol in the heavens, therefore, seemed to shadow forth a new heaven and a new earth, and Columbus inspired by a great thought says: "I am the messenger of the new heaven and the new earth mentioned in the Apocalypse of St. John, after

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having spoken it by the mouth of Isaiah, and the Lord showed me where to find it." At this time the trumpet of Luther had been heard as if to collect together the elect from the four quarters of the globe, and he said: "I do believe that I am that great trumpet which prefaces and announces the coming of the Lord." And when the new heaven and the new earth were discovered in the midst of the dire persecution that followed, a haven of rest was opened for the people of God; and there was a Washington raised up who defended the woman—the church of the wilderness.

While I was studying my subject the different names of those whom I called the "Magi" were analyzed. I found the name of Christopher Columbus fairly interpreted as the "Christ-bearer dove," and it seems as if the name was perfectly fitted to his mission, and I concluded that his crest ought to be a dove. Not until several years later did I find this to be true, when reading the life of Columbus, by the Count Roselly De Lorgues. I found that this crest was three doves, and that he had also taken the same thought in regard to the character of Christopher Columbus as truly the Christ-bearer dove and a prophetic person. In examining the life of John Huss, I found that he had exclaimed at the stake, "You are about to burn a goose, but in an hundred years you will have a swan you can neither roast nor boil." And a commentator said that he must have meant Luther whose crest was a swan Then I searched and found that Luther was called the Swan of Eisleben. In examining the name Luther I found that it was very much related to the name *eleutehros*, freedom, and I was strengthened in this by one day explaining to General Garfield my thought, when he said to me, "Did you know that Luther was derived from the Greek word *eleutheros?*" I said that I did. Now, in thinking how this name was given to him I had pictured him as holding a book in his hand in the manner he is represented at Worms, and then this thought came into my mind "*liber*" book, and "*liber*" free, and "*liber*" tree, and from the tree came the book, for indeed from the papyrus tree came the ink, paper and pen. So the thought is extremely proper that the tree should be freedom, and that he should hold a symbol of it in

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his hand, and that he should be the first man to translate it into the vernacular and to preach it in his own modern tongue. He said, "The Bible is a great tree, and sometimes I pluck off a few pears or a few apples." May it not be the tree with the twelve manners of fruits.

Then again, why *Martin* Luther? Then I sought and found that Martin was the name of the saint who was the grand symbol of the character of the man, for that saint was distinguished for overthrowing superstitions and paganism and was an extremely kind man to the poor.

In examining into the crest of Washington I found that it was an eagle, and an eagle is cut upon his tomb, and again the colors in his crest are red, white and blue. Then since I figured that the woman in the heavens was clothed with the sun, which must be red and white, and that she had stars, those stars must be in the blue. Then I plainly saw that Washington was the proper one to protect the woman, for his colors show that he was that personage, and all the colors are prophetically fitted to the one who should defend the church. Then I said, surely this is the Michael who was to come, and I began to analyze the word—Like unto God—God-like, and have we not had the term God-like applied to Washington in all languages? Then again, Michael was represented as a young knight overthrowing the dragon. Then I remembered that in the Capitol ground he is represented by a colossal figure as a god; and so also in looking into the dome of the Capitol at Washington he is represented as a god. Thus we have Christopher Columbus, the Christ-bearer dove, and the discoverer of the New World; we have Martin Luther, the prophet of freedom, who announced the coming of the Lord, and who holds in his hand the book of that country which Columbus found, whose symbol of the dove was perfectly adapted to the work he had to perform, inasmuch as he was upon an ark, and out of the ark must come a dove; and inasmuch as Luther was the swan, the trumpet bird, the fisherman-bird, a type of the church, whose duty it was to sound the trumpet and call the people together from the four quarters of the globe in order that they might escape from persecution by

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flying to that country prepared by the dove, that the eagle should represent the great leader—the symbol of the warrior who was to defend the woman with his sword and overthrow that power of monarchy which dominated the country. Thus far the whole presented itself to me as a picture, and I desired to have it painted. It was at this time that I came to Cleveland to live, and as I was walking up Superior street my eyes fell upon a magnificent picture in Ryder's window—a picture called "Yankee Doodle"—three musicians, a fifer and two drummers and a standard bearer holding a flag and partly enveloped in smoke, leading a great troop up a hill, and to one side the dying artilleryman who is waving his hand and shouting in his death for victory. The old gray-haired drummer and the earnest fifer with his head bandaged, but still moving onward with determined purpose, and a young scion of the New World looking up with faith and gratitude into the old man's face as they go forward.

As I gazed at this painting I said the painter of *this* picture is the man to paint *my* picture. I sought him and after a long time found him. It was Mr. Willard. I went to him and said that I desired him to paint me a picture. After explaining it to him he said that he would do it. I then determined to try him on the question of finances, and told him he would have to paint it without money. He said that he would do it, as it was a grand thought.

Gazing intently one day at the picture upon which Mr. Willard was painting, a thought came suddenly upon a question partly before considered, and I said: "Mr. Willard, the vision in the heavens certainly typifies a date in history, and I am going out to find it." Poring over old histories and annals that evening at Case Library I came upon the letter of the distinguished divine, Hooker, addressing John Winthrop upon the great work of forming the first confederacy in the New World. He says:

"Much Honored In our Blessed Saviour: At the return of our magistrates, when I understood the gracious and desired success of their endeavor and by the joint relations of them all, not only your Christian readiness, but enlarged faithfulness in

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an especial manner to promote so good a work, my heart would not suffer me, but as unfeignedly to acknowledge the Lord's goodness so affectionately to remember your candid and cordial carriage in a matter of so great consequence, laboring by your special prudence to settle a foundation of safety and prosperity in succeeding ages; a work which will be found, not only for your comfort, but for your crown at the great day of your account. It's the greatest good that can befall a man in this world to be an instrument under God to do a great deal of good. To be a "repairer of the breach" was of old counted a matter of the highest praise and acceptance with God and man; much more to be a means, not only to maintain peace and truth in your days, but to leave both as a legacy to those that come after until the coming of the Son of man in the clouds of heaven."

And then I found that the great act was consummated on September 7th, 1643, and that John Winthrop was the first governor. Turning from history to history I noted the grandeur of this epoch, the closing days of the thirty years' war.

In 1630 sailed the remarkable expedition under John Winthrop, in eleven ships. It is said in the Revelation that the woman fled into the wilderness upon the wings of an eagle. Here these Pilgrims claimed that they were intent upon fleeing to the wilderness to establish a church where they could worship God according to their conscience; and then I found that the name of the flag ship was the great ship Eagle, the name being changed then to Arabella, in honor of a most noble and pious woman who sailed in the great ship Eagle (Bancroft), and in the wilderness the noble leader of the band became the first governor of the new constellation in the west.

1643 was a date of great expectation. The colonists confidently looked for the coming of the Messiah in the clouds of heaven. Vennor was killed in the streets of London at that time, declaring that the fifth kingdom was at hand—the kingdom of Jesus Christ. "In the execution of my western enterprise to India," said Columbus, "human reason, mathematics and charts availed me nothing; the design was simply accomplished as the prophet Isaiah had predicted. Before the end

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of the world all the prophecies must be fulfilled, the gospel preached all over the earth, and the holy city restored to the church. The Lord wished to do a miracle by my voyage to India. It was necessary to hasten his purpose, because according to my calculations there only remain one hundred and fifty-five years to the end of the world."—Letter of Columbus to Ferdinand and Isabella (See Humboldt's Examen Critique, Tome, 1615).

It will be noted that the calculation of Columbus would bring the consummation about the time of the rise of the United Colonies of New England. The annals of Scotland and England mention wonderful sights in the heavens, armies marching and counter-marching, also remarkable astronomical phenomena, a great movement in the under spiritual world. At the moment of the rise of the United Colonies of New England a wonderful scene presented itself. A king about to barter away the dearest rights of the people of God in an unholy alliance —an alliance with those who had prepared the armada for England's destruction—a king who had wasted the substance of the people by putting monopoly in the hands of his favorites, who had claimed the right to sacrifice the substance of the people and levy war, and finally to destroy the great King's daughter, the church. Then arose Oliver Cromwell, the St. George of the age, and said, I will protect the great King's daughter.

Then we see a nation's representatives on their knees in St. Margaret's Church, September 25, 1643, lifting up their hands and swearing—what does Carlyle say of it?

Monday, September 25, 1643. The House of Commons and the Assembly of Divines took the covenant, the old Scotch covenant slightly modified now into a solemn league and covenant, in St. Margaret's Church, Westminster. They lifted up their hands *seriatim*, and then stepped into the chancel to sign a very solemn covenant and bond of all the people. of the awfulness of which we, in these days of regardless talk, cannot form the slightest notion.

Just before the king's head was struck off he took his St. George and handed it to the Bishop and said, "Remember," and his remains went to the Chapel of St. George, and then

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St. George's Cross became more famous on sea and land than ever before, so much so that the children of Judah came from the east to see if this might be the promised Messiah, and he *was* the forerunner to the Jew as a good Israelite himself. As wrote New England to Oliver Cromwell: "We believe that you are fighting the battles of the Lord." God bless and keep green the memory of the giant so little understood and give us a heart to rear a monument to him as to our St. Michael.

Deeply impressed with the importance of my research and discovery I returned to Mr. Willard's study the next afternoon late, and standing before the picture when he was at work, I said: "I have found the date which the picture represents, it is the 7th of September, 1643, old style, in the morning."

"How do you make it out?" said he.

"That I cannot now tell, but some day I will know; I know that I have the truth."

The picture as painted seemed as a talisman, and to some the thought will be an absurdity. It would have appeared so to me had I not been startled with other coincidences in this direction. We may be sure that there is more in the painting or engraving of a constellation than appears upon the surface. This mysterious influence which reveals, which attracts and repels, invisible, subtle as the most subtle of all known things, is no more wonderful than the power which enables one to read the elements deep down in our mother earth. It surely is given us to know this beyond all controversy, and this I am well aware by personal experience. Looking intently at the picture that September afternoon as the sun was sinking in the west, and the clouds were tinged with its rosy hues—Mr. Willard was painting upon the constellation or sign in the heavens—suddenly a thought flashed upon me, and I said to him, "You are painting in September, why, the sun clothes the constellation of Virgo in the month of September, formerly it was in August. What would you say if the Crescent moon was at the foot of the constellation of Virgo on the 7th day of September?"

"Well," said he, "I should consider it a remarkable coincidence."

"It is certainly there," I said with emphasis. "It must

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have been there at that time, I shall prove it. And now what does the crown signify?"

I went at once into the reference room at the public library and searching astronomy, immediately came upon these words, "The Corona Borealis is Ariadne, or Virgo's crown, because it rises after the constellation of Virgo. I then examined the figure of the heavens to see how the crown was placed, and in the particular planisphere examined, I found twelve stars shown almost in a circle, the principal of which is Alpheca. The constellation, however, has more stars in it. The coincidence was so strong that I felt that I must have the signification; so I took the planisphere to Mr. Willard, and had him place the stars according to the arrangement then found. And so I fixed upon the canvass the meaning—that is, the date—viz., 1643, 7th September, 9 A. M. I then wrote to Simon Newcomb, astronomer at Washington, and told him what I desired, and his answer was: "I do not believe in the prophecies, but here is your solution." This gave a perfect representation of a woman clothed with the sun, and the moon under her feet, and upon her head a crown of twelve stars. This was extremely gratifying to the feeling in my heart that I was near the truth, yet I raised objections. The prayer was always in my heart, "Lord, reveal the truth to me in this matter." Yet, when so much came, I was like Gideon when he had asked that the Lord would grant him a sign that he was to save Israel, and it had been given him in having the fleece of wool wet with the dew of heaven while the ground about was dry, and he said, "Let me prove I pray thee but this once with the fleece, let it now be dry upon the fleece, and upon all the ground let there be dew." And the Lord gave him the sign as he desired. So I said, "This seems true, I believe it must be so, but where are the United States? How can the constellation of Virgo be clothed with the sun on the 4th of July?"

And how is it that the 19th of May should be celebrated as the rise of the united colonies, of New England, and historians should be at fault. But going carefully over the records I found that surely on the 7th of September must have been placed the last signature of the colonies' and John Winthrop's seal and

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sign. This seemed sure; but now came the difficulty, and one year passed away from 1876 to 1877 during which time my railroad duties were absorbing, and I dare not let these be neglected, and although in leisure hours I would seek earnestly for a solution, it was not until the year had rolled around to September again that the thought came, surely I must be wrong in looking for a duplication of the sign in July 1776, for it is impossible. But looking over old papers and records again I came upon the speech of John Quincy Adams. At the second centennial anniversary of the rise of the united colonies of New England, in which he said: "The New England confederation of 1643 was the model and prototype of the North American confederation of 1774." In both cases it was the great law of Nature and of Nature's God to advance the kingdom of our Lord Jesus Christ and to enjoy the liberties of the gospel in purity and peace. An empire already bounded only by the Atlantic and Pacific oceans, and to the eye of prophetic inspiration to be bounded hereafter only by the eternal ice of the northern and southern pole. And then I was suddenly struck with the thought that I had been looking for the wrong date—1776 instead of 1774—and now came the question, when in 1774? and I at once jumped to the conclusion, September 7th. Of course the date of the first prayer in Congress is commemorated in a grand picture, and history says that only one knelt then, and that was George Washington. Surely the 7th of September must be the duplicate date. Now to prove it, why the sun must clothe the constellation of Virgo and the moon must be under her feet. How many chances are there that this would not be, to one that it would? I took my book and calculated the position of the moon. The sun surely was right for the symbol, for it was at the head, and if the moon should be at the foot then the sun would naturally clothe the constellation of Virgo in order to illuminate the crescent moon, but to my great disappointment the position of the moon was in the centre of the constellation of Virgo, and I was cast down, for I said surely that date, the 7th of September, should be duplicated. But I remembered that the first date was old style—7th September—which made it really the seventeenth day of Sep-

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tember new style. I thought that in this calculation I might have used wrong elements; so in going to my office I met Professor Harding, of Brooks' school, and asked him if he knew an astronomer in the city who could calculate the exact position of the sun and moon at a date far back. He said that he did, that Miss Fisher, of the Brooks' school, would make the calculations for me. And that he would get her to do it. The question I asked was this: "At what hour, minute and second in the month of September 1774 was the moon at the foot and the sun clothing the constellation of Virgo?" In two weeks the answer came: "Moon at foot of Virgo (Phil. mean time) 1774, September 9th, 7 hr., 51 m., 50 sec. 44 long. of sun at same time 167° 33, or several degrees above head of Virgo."

The 9th of September! What a disappointment! How could it be? I had set my heart upon the 7th because it was a duplicate day of the rise of the united colonies of New England, and certainly I never heard of anything important having occurred on the 9th of September, 1774. It was that day of which Samuel Adams wrote to his wife.

Here was a disappointment. I had expected it would be the 7th of September, 1774, for I had made up my mind that it should be the duplicate, the one of the other, but instead of this here was presented the 9th day of September. For a moment I was entirely cast down, but I went on my way to the office, and passing a book store, I went in and took up the history of the United States, by Bancroft, and there, turning to the date, 1774, my eyes fell immediately on these words: "ON THE WISDOM AND ON THE EXERTIONS AND ON THE FORTITUDE OF THIS IMPORTANT DAY IS SUSPENDED THE FATE OF THE NEW WORLD AND UNBORN MILLIONS."—Joseph Warren, in Suffolk County Convention, *9th day of September, 1774*. The conviction came to my mind instantly that this must be the date, and though I had, as I said, fixed upon the 7th day of September, I had found that this would not fit the position of the heavens. I had sought another person's aid in calculating. This calculation gave the 9th of September, and then I found a date with which I was utterly unacquainted, one of the most remarkable of all American history.

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Paul Revere was sent post haste to Philadelphia on horseback with these resolves, and they were presented on the 17th day of September, just eight days after their passage. They were passed again as the first solemn act of the first Congress of the United Colonies of America, and history calls them the first Declaration of Independence. This date had never made any impression on my mind nor had I known of it. Some of the most remarkable dates in history are concealed entirely until the time it is necessary to bring them out. General Gates, when he had news of the promulgation of this act, said that they must have been drunk with new wine. The answer was, "Not so, for it was not yet the third hour of the day." Here would be noted a very curious combination of dates. On the 7th or 17th day of September, 1643, was passed the Scotch Covenant by the House of Parliament. September 17th, 1630, the date of the foundation of Boston. The 7th, 1643, also was the rise of the United Colonies of New England, that is Old Style—New Style, the 17th.

But the initial point we see is the 9th day of September, 1774, when General Warren and his followers, with their lives in their hands, made that wonderful declaration called the Suffolk resolves. I felt that I had the duplicate, and it was brought to my attention only through the position of the heavens and astronomical vision; and yet with these proofs I did not feel so thoroughly convinced but that I would be sometimes shaken with the impossibility of a prophet having given proofs of the rise of our republic by the position of the sun, moon and stars.

During this year (1877) I had the picture drawn by Mr. Willard for the purpose of photographing it, and I gave a short description of it upon a card, determining to send it out among my friends privately, that they might examine and criticise it. When I had a number of these cards printed, photographed and prepared for distribution, then for the first time did I really comprehend the importance of what I was doing, and I said, "Have I the right to publish to the world a new version of that seemingly sealed book, the Apocalypse of Saint John? Have I the right, unworthy as I am, to attempt to unfold these

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mysteries? This first verse of the twelfth chapter of Revelation had been called a key of the Apocalypse by many. It was and has been a stumbling block to commentators. Mr. Baldwin had said—and he was the only one—that the twelve stars represented the twelve United States.

Then these words of Luther came distinctly to my mind, "Every man must interpret the Scriptures for himself." And yet with this I said, "I wish that I had convincing proof to my mind that I have a right to promulgate this thought, and that I may have a sign to prove to me that I have it." I retired that night more thoughtful than usual and deeply impressed with the importance of the matter I had in hand, hoping that something would come to convince me of the correctness of my position. Next morning I awoke early with my mind intently fixed upon the same thought, and I said to myself, "How shall I get this sign?" Then came the Scripture to me of the sign of the Prophet Jonah; but in a moment my little girl came rushing into the room and said, "O, papa, look at the American flag in the heavens." I was loth to be disturbed, but got up and went to the window, and there observed a bright picture of the Stars and Stripes in the heavens, calling to my mind,

> "He striped its pure, celestial white
> With streakings of the morning light."

I was in the habit of selecting a verse of Scripture for my children to repeat at the breakfast table, and the thought came that the verse that I should select for that morning might strengthen and guide me. When I opened the Bible, I saw but one verse—the seventh verse of the fiftieth chapter of Isaiah—"*For the Lord God will help me; therefore shall I not be confounded; therefore have I set my face as a flint and I know that I shall not be ashamed.*" This it will be noticed is called "bibliomancy," and there was a time when the Pope's Bull was issued against its practice, but it had been the practice for some time of my own mother, and I could not consider it wrong. I believe that this verse was given me to sustain and strengthen me against the doubts and fears of my own nature and my mistrust, not only of worldly persons, but of ministers in the church; and so I placed it at the bottom of my picture under

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the coat-of-arms of my father and my mother. In this year I determined to have a large picture painted making each one of the figures full size. And I had Mr. Willard study particularly the figures and faces and the characters of Columbus, Luther and Washington. It was my desire to present Columbus in a prayerful attitude, thanking God for the consummation of his hopes and prayers. I desired to have Luther placed in a position as at Worms with an open book in his hand, inasmuch as he was a prophetical character representing the angel of the tenth chapter of Revelation. I had him represented with an aureola over his head and in a prayerful attitude. I desired these figures to be changed in expression to give them an attitude of prayer. To this Mr. Willard demurred, saying that it would be impossible; but when I urged it he attempted it, and was successful in giving the desired expression. In Washington also I wanted the prayerful attitude, representing him at the time of the surrender of Cornwallis at Yorktown, when a nation as well as the army were on their knees. Each of these characters would have the birds which they represented—namely, the dove, the swan and the eagle. Upon examining the books upon the subject I found that it was the custom in ancient times to portray persons who had holy missions with birds' heads, as St. John was painted with an eagle's head, and St. John may be considered the eagle prophet. Columbus was represented with a staff and the banner of his mission, upon which was represented the Saviour upon the Cross, and above Christo Ferens. Columbus always signed his name with the letters

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S A S

X M I

XPO FERENS

which was a prayer, and below this,
Servus suplex altissimi Salvatoris—Christus, Maria, Joseph—Christo Ferens.

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During the year 1878 I noticed the remarkable earnestness with which the ladies of Boston had taken hold of the preservation of the old South Church. Mr. Willard's painting had been sent there and placed on exhibition, and it struck me that the Suffolk Resolves ought to have been passed there. I determined to investigate the matter.

In June I attended the Convention of the American Society of Civil Engineers in Boston, and I entered the old South Church for the first time on the 20th of June and examined its historical points. I endeavored to examine into the Journal of General Warren, but the representative of the Warren family was not there, and I could not see the book. It occurred to me that some old letters of the Warren family, or some of those who were present at the passage of the Suffolk Resolves would disclose something more important than would be found in history about the remarkable character of the proceedings of that day. So I left the place and went to the State House and there found something that I much desired to see—namely, a statue of General Washington, and a remarkable slab presented by Earl Spencer to Charles Sumner, and by him presented to the Commonwealth of Massachusetts. Here I also saw a photo-lithograph which was presented to me of the inscriptions on these slabs. This was very interesting and showed positively the colors of the red, white and blue and the stars, and convinced me of the correctness of my thought that these were the same as the colors in the vision of the heavens, and that his crest was an eagle. This surely pointed out Washington as the one who should defend the woman or the church, the representative of Michael in the New World. Going from there to the city library I examined all the old documents and records I could find in relation to the Suffolk Resolves, to find the place of their passage, but was disappointed. I sought the life of Paul Revere. I was directed to the Historical Library. Rain began to fall and I was discouraged. It was Saturday, and I concluded that I would have to leave the city without having completed my mission. I went to the hotel, paid my bill and was about to leave, when I met the landlord, Mr. Wollcott, at the door.

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He asked me what things of interest I had seen, and I told him that I was about to leave the city discouraged. He asked why, and I said, "I am seeking for a house where the Suffolk Resolves were passed." He said, "I am your man. I can tell you the very house, and there is a marble slab in that house which will give you important information. Mr. Latimer I pass that house every day, and I never pass it without taking off my hat. This reverence is involuntary." I said, "I shall stay to-night and go to that house to-morrow after church." The next day, without my dinner, I made directly for Milton, where he said I would find the house near the Old Colony Depot. It was half past two o'clock on Sunday afternoon, on the 23d of June, when I stood in front of the house, a two-story frame building, well preserved, with a portico in front. It might have been called a handsome house in its day. Before it stand three remarkable elms. I was struck with the size and grandeur of these trees, and I thought of the tree of which Luther spoke. There is something in the elm of more than ordinary significance. On the front of the house there was an inscription, "In this mansion on September 9th, 1774, at a meeting of the delegates of every town and district in Suffolk, the memorable Suffolk Resolves were adopted. They were reported by Major General Warren, who fell in their defense in the battle of Bunker Hill. They were approved by the members of the Continental Congress in Philadelphia, on the 17th of September, 1774. The Resolves to which the immortal patriot first gave utterance, and the deed of that great day upon which he fell, led the way to American independence Posterity will acknowledge the virtue which preserved them free and happy." When I had read these words, I said, "This is the birthplace of American Liberty, and the Lord has shown me where to find it."

I said that the thought came to me that the Suffolk Resolves had been passed in the Old South Church. In this I was disappointed, but upon examination of the history of the Old South Church I found that the very spot upon which it stands was the prophetic spot of the rise of the United Colonies of New England in 1643, when John Winthrop must have signed the articles of confederation. I said once to Mr.

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Willard that the flag might be said to have been born in the Old South. And when I got its history, and saw the account of the hoisting of the flag on the Church in 1861, I read the words of the orator, "We welcome thee back to thy natal spot, to the place where thou wert born, flag of the free."

It is a strange coincidence touching this subject of astronomy or astrology, that the position of the heavens at the moment when I stood before the house was the same as on the 9th day of September, at 9 o'clock in the morning, 1774; this time that I stood there being between 2 and 3 o'clock in the afternoon of June 23rd.

I endeavored to gain an entrance to the house, but the child who came to the door said I could not go in on Sunday, but I must go to Mr. Safford, the owner. He received me very cordially, and when I explained my mission he gave me all the information in his power.

My first question was: "What time did this meeting take place?" He said, "Between 9 and 10 o'clock in the morning." I asked him what time they passed the Resolves. He said that as far as Mr. Frothingham, who was examining the subject, had been able to find out that they passed late in the afternoon. I asked him if he had no letters of a private character which would give information about that remarkable day, and he said that Mr. Frothingham had collected many letters on the subject. He then read to me a portion of his address delivered on the centennial of the passage of the Resolves on September 9, 1874, which was about the beginning of the centennial celebrations. He informed me that a part of the resolves would be found in gilt letters on the inside of the house, and said that the fact that our forefathers looked upon this confederation of the colonies as a religious confederation, lent color to my thought.

When reading the editorial remarks upon the address of Mr. Safford, I was struck deeply with these words which confirmed my own utterance: "It seems to be a part of the duty of the good people of Milton to cherish the old house and its inscription, and preserve it intact as the birthplace of American liberty."

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I cannot think of the circumstances which surrounded our forefathers at the time of the passage of these resolves without thinking of Bethlehem. These men had desired to meet in the old South Church, but they could not; they were forced outside. Therefore Liberty could not be born in the city because five thousand troops occupied the neck, and they could not enter. Hence their meeting had to be in this old house. Then I thought, here is a duplicate. This, it seems to me, was the birth of Christ's kingdom. Here was a similar situation, and they all had to go outside of the city, and liberty was born there. It is said in the Scriptures that the star stood over the place where the young child was. "Surely," I thought, "this may be the same thing," and I concluded that 4 o'clock was the time of the birth of these Resolves, and that the Corona Borealis marked the passage of the Resolves in the afternoon of the 9th day of September, 1774. Then I recalled the fact that at sea in taking observations as we stood near noon watching the sun rising to its culmination, we would say, "Is the sun on the stand?" Then the thought came, "Is this constellation passing the meridian at the exact moment of the birth of this child" And then I thought, "This Corona Borealis must have been over Jerusalem at the moment of Christ's birth.

I afterwards found from Kepler's works that it was a constellation that marked Christ's birth, and not an ordinary light. This of course is a natural thought. On my return I asked Professor Stockwell, the astronomer, to examine the position of the Corona Borealis in the year One, or the beginning of the Christian era, to see whether it was vertical over Jerusalem at that time, which he did. And it was there, having moved about nine degrees north in 1800 years. I then sent Dr. Seth Pancoast, of Philadelphia, who has given much attention to the study of astrology, a copy of my picture—the Stars and Stripes of the Magi—and asked him if he could give me any assistance. His answer came: "What you are seeking is the UNVEILING OF ISIS, but neither you nor any other man can unravel that mystery, unless you understand the subjective Kabbala. You are beginning at the wrong end; you are beginning with the

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objective Kabbala." Up to this time I had not thought of the subject of Isis, nor did I comprehend its meaning.

This brings me to the last phase of my subject, which I propose to present and finish in the next number.

CHARLES LATIMER.

METRIC SYSTEM PROPOSED BY MR. JACOB M. CLARK.

(*Arranged from correspondence with the Committee on Standard Time*).

Adjustment; increase the English inch, and also the Arabian gauge or guz (= 25 English inches) each by its 1-1000 part.

For the Arts: Inch decimally subdivided.

Denomination.	Metric Feet.	
City, or Builders' chain,	100.	=40 cubits = 5 rods =4 perches. Value, =83.416+English feet.
" reed,	10.	=4 cubits
" foot,	1.	the natural foot.
" inch,	.1	=value, 1.001 English inches.

City lot=30×120 feet=13×48 cubits metric. 10,000 inches metric is the entire boundary of a square acre.

Engineering and Geodesy: Cubit decimally subdivided.

Denomination.	Metric Cubits.	
Earth's semi-axis (polar,)	10,000,000.	Grand Unit for Astronomy and Geodesy,
Acre (side),	100.	Convenient length for steel tape-chain. value=208.5416+English feet.
Perch,	10.	Convenient length for base-bar, value = 20.854+English feet.
Cubit,	1.	Unit for engineering, leveling, etc.; value 25.025 English inches.

Solid cubit, the measure of engineering quantities.

Superficial acre of 10,000 square cubits contains 43,489 and 44-100 square English feet and differs from the English acre by 1-6 of 1 per cent.

Adaptations for Rural and Commercial Purposes.

8 cubits=metric rod=200 inches metric, for land, etc.

2 cubits=metric staff=50 metric inches for wood, etc. The metric cord=about 1¼ present cord.

Metric ell=40 metric inches, for cloth, etc.

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Circular Measure: Time, arc and angle measure.

Denomination.	Metric Degrees.	
Circle,	240.	The quadrant=60 degrees metric.
Metric hour angle,	10.	The Zodiacal sign=20 " "
" degree,	1.	=1½ degrees, current division.
" minute, or prime,	.1	
" second,	.01	
" third,	.001	

Geographic: Road and sea measure.

Denomination.	Metric Miles.	
Mean great circle,	24,000.	} terrestrial, *upon radius of volume.*
" degree,	100.	
" offing,	10.	
Metric mile,	1.	Value=5472 Eng. ft.= { The True Turkish mile ¼ of ancient parasang .½ sum of Jewish mile and Sabbath day's journey.
Metric stadium,	.1	=Stadium of Posidonias.
" road-chain,	.01	= { Knot-measure, glass 1-100 an hour. Mast-length, the height from which the horizon appears ten miles away.
" fathom,	.001	=3 Jewish civil cubits (Mosaic).
" span,	.0001	=0.2624 cubits=6 and 56-100 ins. metric.

Metric furlong, or cable length=125 fathoms.

(Kilometer of France=6-10 of metric mile, very nearly).

8 furlongs, or
10 stadia, or
328 rods.....or
2,624 cubits, or
6,560 feet metric
} =one mile and { ⅛ mile=41 rods.
⅛ furlong=41 cubits.
1-16 stadium=41 feet metric.

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ANALOGUES OF AVOIRDUPOIS POUND.

FROM ALEXANDER'S "WEIGHTS AND MEASURES."

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Agito	Pegu	0.848214
Arratel	Portugal	1.011860
Cheki	Bassora	1.028571
Frongeweicht	Augsburg	1.082621
Funt	Cracow	0.894929
Funt—old measure	Poland	0.894929
Funt—since 1819	"	0.894089
Funt	Russia	0.901691
Krinne—small	Graubundten	1.147243
Libbra—peso grosso	Belluno	1.139150
Libbra	Corfu	0.900419
Libbra, of Venice	Ionian Isles	1.051857
" new standard	" "	1.
" peso grosso	Padua	1.072663
" peso grosso	Rovigo	1.052379
" peso grosso	Treviso	1.139250
" peso grosso	Venice	1.052750
" peso grosso	Verona	1.101986
" peso grosso	Vicenza	1.072663
Libra	Acapulco	1.014286
" for chocolate	Alicant	1.046571
"	Bllbao	1.078800
"	Callo	1.014286
"	Canary Islands	1.014843
"	Caraccas	1.014286
"	Castille	1.016097
"	Catalonia	0.882
" sutil	Gallicia	1.016286
"	Gibraltar	1.0175
" English	"	1.
"	Guatemala	1.014286
"	Madeira	1.010929
"	Madrid	1.016097
" menor	Minorca	0.882
"	Mexico	1.014286
"	Montevideo	1.014286
"	Seville	1.015337
"	Valparaiso	1 014286
"	Vera Cruz	1.015337
Livre—old measure	Amiens	1.017286
"	Antwerp	1.036668
"	Arles	0.862681
"	Avignon	0.901143
"	Besancon	1.064943
" old measure	Bordeaux	1.09
" new measure	"	1.102369
"	Bourbon Islands	1.079219
"	Bourges	1.032571
" commercial	Brussels	1.031143
" for gold and silver	"	1.084740
"	Cambrai	1.036286
"	Carpentras	0.881895
" metrical	France; till 1840	1.102369

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Name.	Locality.	Value, Avoirdupois Pounds.
Livre—poids de marc	France; before 1800	1.079219
" for silk	"	1.011768
" apothecaries', new measure	" since 1837	1.102369
" current	Geneva	1.101816
" old measure	Grenoble	0.920186
"	Savoy	1.079219
"	Haiti	1.079219
"	Lausanne	1.102369
"	Liège	1.029879
" jewellers'	"	1.084913
" old measure	Limoges	1.062514
"	Louvain	1.034614
" commercial	Lyons	0.944317
" for silk	"	1.011768
" poids de marc	"	1.079219
" commercial	Marseilles	0.899349
" commercial	Mons	1.026457
" jewellers'	"	1.084264
" old measure	Montpellier	0.887259
"	Namur	1.028729
" old measure	Nancy	1.004714
" old measure	Nantes	1.090071
" commercial	Neufchâtel	1.146710
" for gold, silver, etc	"	1.079219
" wholesale	Rouen	1.122378
" of Alsace; old measure	Strasburg	1.037711
" old measure	Toulouse	8.099430
" old measure	Tours	1.048857
" old measure	Troyes	1.146464
Mina	Ancient Attica	0.962582
Nen	An-Nam	0.860950
Pfund	Aarau	1.050747
"	Aix-la-Chapelle	1.029703
" for spices, etc	Appenzell	1.025549
" old measure	Augsburg	1.041943
" apothecary	Austria, generally	0.926
"	Baden	1.102369
"	Basel	1.079232
" since 1816	Berlin	1.031180
" before 1816	"	1.032895
"	Berne	1.146710
"	Bremen	1.099062
" old measure	Breslau	0.902067
"	Brunswic	1.0306
"	Bohemia	1.134
"	Cologne	1.030611
"	Dresden	1.029265
"	Frankfort	1.114073
" for gold and silver	"	1.031552
"	Gotha	1.030510
"	Hamburg	1.067886
"	Hanover	1.079444
" old measure	Heidelberg	1.112382
"	Hesse-Cassel	1.067534
" for gold and silver	" "	1.031310
" since 1821	Hesse-Darmstadt	1.102369
"	Holstein	1.067975
" old measure	Konigsberg	1.032940
"	Leipsic	1.030598
"	Lippe	1.030596
"	Lubec	1.068744
" old measure	Luneburg	1.073

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NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Pfund	Mecklenburg	1.067154
"	Nurnberg	1.124321
" for gold and silver	"	1.052
"	Oldenburg	1.059083
" old measure	Prague	1.134286
" legal	Prussia	1.031180
"	Rostock	1.120452
" for gold and silver	S. Gall	1.033131
" for gold and silver	Schaffhausen	1.014190
"	Solothurn	1.143110
"	Weimar	1.030598
"	Wurtemburg	1.103114
" for gold and silver	Zurich	1.035682
Pond; of Brabant	Amsterdam	1.037080
" Troy	"	1.084740
" former	"	1.087875
Pound; imperial	England, since 1825	1.
" Troy	Scotland	1.088778
" avoirdupois	United States	1.
"	Denmark	1.100885
" for gold and silver	"	1.038000
"	Sweden	0.937284
Ratel; mean	Persia	1.025
Rautul	Travancore	0.999964
Rotl or Rottôlo; feuddi; for gold and silver	Algiers	1.096714
"	Bet-el-faki	1.019531
"	Cairo	0.950312
"	Guinea	0.953782
"	Tripoli in Africa	1.112095
"	Tunis	1.091547
Rotôlo	Genoa	1.15359
"	Majorca	0.92794
Seer; commercial; mean of 22	East Indies	1.049423

ANALOGUES OF **10** POUND WEIGHT, (STONE.)

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Balman	Shiraz	10.12687
Dhurra; mean of 16	Hindostan	10.047190
Pussaree	Calcutta	10.266137
Stein; for wood or feathers	Altona	10.6975
"	Baden	11.023685
"	Solothurn	11.4311

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ANALOGUES OF **100** POUND WEIGHT (CENTAL).

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Caban; of rice	Ternate	100.333333
Cantaro; since 1816	Alexandria	95.56
" for cotton	"	95.
"	Balcaric Isles	91.73
"	Florence	112.3
" grosso	Genoa	115.31
" sottile	"	104.83
"	Leghorn	112.3
" piccole	Naples	106.080
"	Tripoli in Africa	111.20954
" barbaresco	Minorca	88.20
"	Tunis	109.1547
Cariolla; for salt	Santa Maura	104.13
Centner; actual measure	Breslau	113.44
"	Darmstadt	110.23685
"	Copenhagen	110.11
"	Norway	110.11
"	Nurnberg	112.4321
"	Prussia	113.44
"	Zoll-Verein	110.23685
Centenar	Amsterdam	108.94
Hundred-weight; nett	England; 1300	100.
" " for sugar and wax	" "	108.
" " for wool	" "	110.
" "	Great Britain	112.
" "	Maryland	100.
" " for coal	"	112.
" "	United States	112.
Lagel; for steel	Prussia	103.11550
Last; commercial	Amsterdam	85.245696
" commercial	Lubec	96.930940
Kichkar	Anc. Hebrews	96.258287
Maund; mean of 6	Bengal; prov	85.541833
" mean of 2	Malda; prov	100.45
" for cotton; mean of 2	Malwah	86.4746
Moosa	Cyprus	112.
Oder	Majorca	100.217784
Quintal	Aragon	109.738476
"	Bordeaux	110.23685
"	Buenos-Ayres	101.4178
"	Canary Islands	101.483944
"	Castille and Chili	101.6097
" old measure	France; generally	107.9219
" Castillian	Gallicia	101.6163
"	Majorca	89.95327
" barbaresco	"	92.794247
" old measure	Marseilles	89.931222
"	Mexico and Peru	101.6097
"	Minorca	91.537533
"	Valencia	109.728476
Quintale; peso grosso; old measure	Venice	105.275
Scroon; for raisins; mean	Malaga	88.908488
Talanton	Ancient Babylonians	96.258295
" Æginetic	Ancient Greeks	96.258295
Talento; actual measure	Ionian Isles	100.

The surprising range of the analogues of the avoirdupois pound in the metrics of the world is suggestive of the question whether, after all, the idea of John Quincy Adams, in effect,

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that systems or standards of measurements preceded the organization of society, is not a pretty close shot at the truth. It will be understood, in reading the table, that if the linear dimension had become degraded or exaggerated by 5 per cent., the cubic dimension would be affected by a little over fifteen. Accordingly I have taken the limit at 15 per cent. either way. Under a less stringent rule the list would, of course, have been more extensive. The entire conspectus embraces the varieties of the mark, which I conceive to be derived from the Roman *as*, and of the troy and apothecary pounds, representing the Roman *pondus* and *nonuncium*

In the table of linear and square measure, submitted some time ago, no attempt was made, further than to suggest something that would practically meet the wants of the American people. And the writer had remarked (Trans. Am. Soc. C.E., Dec. 1881) that "the inch being subordinate, it remains a question whether weight and capacity should not be founded on the radial cubit" Further investigation has shown, however, that if we raise the itinerary span, as the writer gave it, to the third power—*i. e.*, $(6\frac{56}{100}$ Pyramid inches$)^3 = 282\frac{3}{10}$ cubic Pyramid inches, we strike the imperial gallon of 10 pints, and in water a weight of 10 avoirdupois pounds, close upon the present scale of usage. It is a question, then, whether the pint and the pound should not be regarded as fundamental units rather than the ounce and the grain. It does not affect the logic of Totten's principle one way or the other, but simply shifts the transition factor in his grander and more comprehensive scheme to another place in the scale. And this accords with Professor Piazzi Smyth's idea of the relation of the pint and the pound to the coffer in the king's chamber.

In the ultimate adjustment and re-arrangement of our methods of expressing the correlation between weight and capacity and the various forms of force or "modes of action," which Colonel Stephen M. Chester insists is both feasible and necessary, it is apparent that the π-relation must come in somewhere. The span is both π-related and earth-commensuric under the most perfect division of the circle. It monuments, at the same time, the fact and amount of the earth's ellipticity. It is a natural

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human measure and it is cosmic. These considerations confirm me in the belief that the pint (or the imperial gallon) and the pound will be the units for scientific purposes. But I see no reason why the ounce, $\frac{1}{16}$ of a pound, should not also be a unit for its own appropriate sphere. And, if the habits or convenience of any people create a preference among them for the mark or the troy pound, they could be adjusted respectively at eight and twelve ounces. As there must always be individuals, so there must always be separate nationalities. But the correlations between their methods can and should be expressed by simple factors. Fractional arithmetic, too, is indispensable for the minor affairs of traffic and industry.

JACOB M. CLARK.

NEW YORK, August 8th, 1884.

GLIMPSES OF OUR CELTIC ANCESTORS BY EDWIN WILMSHURST RETFORD, NOTTS, ENGLAND.

PART II.

We left Pudens, the Roman Patrician with his Cymric wife Claudia, on military duty, at Regnum (now Chichester) in Britain about A. D. 60. How and when did the Apostle Paul become acquainted with them? Our Lord instructed his apostles when rejected by the house of Judah, to go to the "lost sheep" of the "house of Israel," and accordingly we find that after the day of Pentecost, the twelve separated, never to be reunited in this world; and instead of preaching to the people most contiguous to the Holy Land, they penetrated into far distant and separated countries—*e. g.*, St. Thomas journeyed to the extreme confines of India, and converted the people still called after him, viz: the "Christians of St. Thomas" on the coast of Malabar. Following up we may reasonably conclude, a remnant of the "escaped" of Israel who had gone east, when the main body went off west, as recorded in II Esdras xiii, 40-46, and I Maccabees xii.

And would the great apostle forget those "lost sheep" in the West, scattered among the nomad tribes of Celtic Gentiles, to whom he was expressly sent? No; we read that his journeys always tended in a westerly direction, and we have it expressly recorded by Clemens Romanus, his friend and fellow laborer, that he visited not only Gaul and Spain, but the UTTERMOST parts of the west; for allowing (which no one doubts) that he journeyed to Gaul and Spain, there was a country still further west which, alone, could be the "uttermost;" and if Great Britain is uot expressly mentioned, considering the long previous colonization of Cornwall, Devonshire, and Ireland, by Greek Phœnicians, it would be highly improbable that St. Paul made Spain the end of his travels, even if persistent tradition and isolated remarks in Roman authors did not affirm the contrary.

Eusebius asserts that the apostles "planted Christianity in Britain, and passed the ocean to the British Isles." Baronius, on the authority of an ancient Vatican manuscript, "that the gospel was preached there by Simon Zelotes and Joseph of Arimathea, A. D.

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35, and that the latter died there." Callistus makes the same assertion. Dorotheus, Bishop of Tyre, records the landing in Britain of Simon; that he was slain and buried there, and (note this) that Aristobulus (mentioned in St. Paul's Epistle to Romans) was ordained first bishop at a time when we know from the Welsh ode, translated by Lord Aberdare—

> "His country's stay, the valiant and the sage,
> Was Bran-Ap-Llyr, the eagle of his age."

And the Welsh triads tell us, moreover, that "Bran, the blessed, first introduced the Christian teachers," and that on his return from Rome—where he was seven years a hostage for his son Caradoc, or Caractacus—"He was accompanied by Arwystlihen (Aristobulus the aged) a man of Italy," whom the Silurian Pedigrees of saints describe as being "the chaplain or confessor of Bran." William of Malmesbury agrees with the Vatican manuscript about Joseph of Arimathea, but gives his arrival as sent by St. Philip A. D. 61.

Lippomanus asserts that St. Peter preached to the Britons, for he carried (says Nicephorus) "the doctrine to the Western ocean and the British Isles."

Irenaeus (2nd century) speaks of Christianity as propagated to the utmost bounds of the earth by the apostles, and specifies churches in Spain and "among the Celtic nations"—*i. e.* Gaul and Britain.

Tertullian (2nd and 3rd centuries) states that Christ reigns over Britain, which the arms of the Romans had not yet subdued. "St. Jerome" (4th century) says St. Paul, "after his imprisonment, having been in Spain, went from ocean to ocean, and preached in the western parts." We know that Bran was sent to Rome as hostage in A. D. 51, remained seven years and was converted there, and released by the imperial edict in A. D. 58, and moreover, that St. Paul was sent to Rome as a prisoner in A. D. 56; was on parole "in his own hired house" for two years, and was consequently, by the same edict, released at the same time as Bran, A. D. 58, so that Paul, of Judah, and our Cymric hero Bran, both Christians, were both set free in Rome together, and that Aristobulus, another Italian Christian mentioned by St. Paul in his Epistles, accompanied Bran back to Britain as his chaplain.

Here is a glimpse of the first beginnings of Christianity among our Celtic ancestors, which cannot fail to be interesting to those who can understand that the mission of the apostles to lands as far apart as Malabar in India, and the Celtic colonies in Britain, was not the result of accident or chance, but a part of that great drama which, beginning with the "casting out" of the ten-tribed house from Samaria to Media B. C. 700, will, under the never slumbering eye of the Shepherd of Israel, go yet beyond our own times, until the "house of Judah" shall walk to the "house of Israel," and they shall go together to their own land, never again to be rooted up.

We shall in our next chapter endeavor to prove that Pudens and Claudia, when the term of military service in Britain was completed, resided at Rome, and were the patrons and protectors of both Roman and British Christianity.

It is not improbable that the (still existing) streets of Roman Chicester may have been trod by Aristobulus and St. Paul during the residence of Pudens and Claudia in that city. It is almost *certain* that they were also visited by the future destroyer of Jerusalem, after Aulus Plautius, with his German Auxiliaries and his elephants (the bones of one of which were found near Battle Bridge) had subdued the Regni, he was succeeded by Vespasian, who fought many battles with the natives, took twenty towns and the Isle of Wight. When Vesparsian was once surrounded by the Britains, his son Titus rushed to his rescue and extricated his revered parent, thus training himself in Britain for the awful task he was, as an instrument of Providence, to accomplish in punishing the House of Judah, by subjecting to the Roman arms, for a limited period, the "Lo-Ammi" outcasts of the Khumric or Cymric branch of the "House of Israel."

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AN OPEN LETTER TO THE PRESIDENT OF THE UNITED STATES.

At a special meeting of the New York & New Jersey Branch of the International Institute, the following resolutions were unanimously passed, and a Committee appointed which drew up and signed the following open letter:

WHEREAS, The Ohio Branch of the "International Institute for Preserving and Perfecting the Anglo-Saxon Weights and Measures" is at this moment in special session at Cleveland, Ohio, considering the subject of the Standard Time, and whereas this subject, in October, is to come up, together with other equally important topics, before an International Congress to be convened at Washington,

Resolved, That the New York and New Jersey Branch of this Institute extends its sympathy and interest to the Ohio Branch, and pledges its best efforts to bring the objects of our society into public notice. In furtherance thereof, and in view of many contingencies with which this subject is surrounded,

Resolved, That an open letter be addressed to his Excellency, the President of the United States, asking that the conservative element in favor of retaining and perfecting our national weights and measures, be accorded a due representation in the coming International Congress which is to convene at Washington, D. C., upon October 1st, 1884.

Resolved, That a Committee be appointed by the President with power to act and to draw up such a letter, setting forth the urgency of the occasion, and calling attention to the danger which threatens our institutions.

Resolved, That said Committee sign the document in behalf of the New York and New Jersey Branch of the International Institute, and that it be duly forwarded through the President of the Branch to his Excellency, the President of the United States, and that they furnish copies thereof to the Press, with the request that it be kindly favored with an early publication.

NEW YORK AND NEW JERSEY BRANCH OF THE INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING ANGLO-SAXON WEIGHTS AND MEASURES.
ROOM NO. 24, COOPER UNION,
NEW YORK CITY, July 30th, 1884.

TO THE PRESIDENT OF THE UNITED STATES OF AMERICA, CHESTER A. ARTHUR, EXECUTIVE MANSION, WASHINGTON, D. C.:

Mr. President: In October, 1883, an International Congress was appointed by the several countries represented to decide upon a Standard or Prime Meridian, and met at Rome.

The Anglo-Saxon representation strongly urged the adoption of the long established and universally known English and American lines.

A disposition to accept such lines was manifested by the Latin representation, provided the English and American delegations accepted and endorsed the French Metric System of Weights and Measures.

This Congress arrived at no definite conclusion, but adjourned to reassemble with somewhat changed personality, perhaps, at Washington in the coming October (1884). Although the American Convention is an entirely original one, convened by yourself, at the suggestion of a Resolution of the United States Congress, it will thus, nevertheless, necessarily have the nature of an adjourned meeting of that held last year.

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It is now distinctly and popularly believed that this Congress is not only to arrange for the one or several meridians above alluded to, but under cover of such authority is expected by the Latin nations to commit this nation to the acceptance, or at least the endorsement, of the system of weights and measures by which the English speaking peoples must in future be governed.

This convention will thus, unquestionably, have to consider and pronounce upon subjects of the very greatest importance to the masses, and which were not originally contemplated by Congress as belonging to the report to be made.

We, therefore, representing the large majority who are anxious to preserve and perfect the Anglo-Saxon System of Measurements, and who are convinced that while you have already selected delegates to represent the country in this Convention, on account of their high scientific ability, and as those who would best support our own interests and desires in the mere selection of a Prime Meridian, and yet certain that the Convention will have to consider, report upon, and at least partially commit the nation in other and far more extended directions, do respectfully submit to you the accompanying arguments in favor of the retention, with improvements, of our own ancient and popular system of weights and measures, and as forming part of this communication, request their careful consideration.

We also earnestly request that if any or all of those whom you have chosen to represent the nation in the said Congress are already committed to, or partially favor, the adoption of any foreign system of weights and measures, that at least the very great mass favoring the conservation and perfection of the Anglo-Saxon systems shall be equally represented. We have the honor to be, sir,

Your most obedient servants,

STEPHEN M. CHESTER, C.E.
President of the Committee.

MEMBERS OF THE COMMITTEE.

FRANK H. NORTON,	E. HAZZARD SWINNEY.
B. S. CHURCH, C.E.	JOHN R. MOORE, C.E.
GEO. HENRY FELT, C.E.	ASAHEL ABBOTT.
C. V. SIDELL, C.E.	CHARLES E. MAXWELL.
SAMUEL MCELROY, C.E.	CHARLES. D. CHAPMAN.
CHAS. K. GRAHAM, C.E.	COOK TALCOTT, C.E.
A. V. BENOIT.	JAMES KITCHEN.
J. H. STILLING.	C. W HAVEMEYER.
CHAS. W. CARPENTER.	GEORGE KELLOGG, C. E.
J. N. WING,	WM. K. MCALLISTER.
A. B. PAINE.	E. NEHAB, S. T. D.
FRANK H. FIELD.	P. H. DUDLEY, C.E.

Respectfully forwarded to his Excellency the President of the United States of America.
By direction of the Institute.

THOS. F. ROWLAND,
President N. Y. and N. J. Branch.

ARGUMENT BY COMMITTEE.

ROOM 24 COOPER UNION,
NEW YORK CITY, July 30, 1884.

TO THE PRESIDENT OF THE UNITED STATES OF AMERICA, CHESTER A. ARTHUR, EXECUTIVE MANSION, WASHINGTON, D. C. :

Mr. President: We have the honor most respectfully to invite your attention to a matter which we cannot but feel has never been presented to you in the light of its true national importance.

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A consideration of what we have to submit is, however, so urgently needed at this juncture, that we trust the employment of a somewhat irregular method of bringing it to your attention will be pardoned.

As the Executive of so great a people, we are convinced that every subject which concerns the permanence of our institutions is sacred to you.

One of them is so seriously threatened at this moment, that we cannot resist the impulse to carry it directly to your consideration.

We refer to a matter which is certain to come up before the International Convention that will convene at Washington, D. C., upon October 1, 1884, and to which you have already appointed three delegates to represent our own country.

The ostensible object of this Congress of Nations is to decide upon a Standard, or Prime Meridian, from which hereafter the world is to estimate Longitude, Time, etc., etc.

Though called by you at the suggestion of a Resolution of Congress, and thus a measure of purely American origin, it will necessarily have the character of an adjourned meeting of the International Geographical Convention which convened last October at Rome.

The latter Convention, after having duly considered the several advantages offered by each of the proposed meridians, recognized the claims of that of Greenwich—an Anglo-Saxon one—and recommended its adoption. It is for the purpose of reconsidering this whole topic, and definitely fixing the selection, that the coming Convention is to meet.

But there was an important resolution passed at this Roman Convention which should not be allowed to escape your notice.

In conceding the location of the Prime Meridian for all time and people at the centre of an Anglo-Saxon civilization, other nations have undoubtedly put their own national prides into the background.

But they have not taken this step unwittingly, nor without a proviso which merits careful attention from the delegation who are to represent American and still more widely Anglo-Saxon institutions.

It is a well-known fact, and a noticeable one, that in every International Convention of the past the representatives of Anglo-Saxon people have always occupied and maintained a conservative position.

"We dwell alone," as it were, upon many international principles which other nations have long since abandoned. It is a race-characteristic of the English people so to do, and it is one, whether to be fostered or not, that should always be allowed a due weight in the representation of this country at International Conventions.

Now it was significantly resolved at this same Roman Convention that, in view of the concession of the Latin nations, above noted, the Anglo-Saxon world, and particularly the United States of America, should recede from their conservative position upon the question of Weights and Measures, and in return adopt the French metre, and come into the International Congress of Metrology.

Twenty of the thirty nations which will probably send delegates to Washington are already metric nations. The Convention will thus be overwhelmingly metric, and will naturally lean toward passing not only similar resolutions, but toward making them perhaps in the form of deliberate provisos.

If we mistake not, our own delegation has pronounced tendencies in the same direction. President F. A. P. Barnard, LL.D., S.T.D.—its chairman—is and has been for years the prime mover in all efforts to force the metric system upon our people.

Hitherto these efforts have failed. They have not been the result of any popular movement of which either the American Metric Bureau or President Barnard have been exponents. They have rather been the effort of a small minority of self-appointed reformers who would begin with an universal iconoclasm of all that is either good or bad in our native metrology.

In appointing additional delegates to this Convention, therefore, may we respectfully

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request you to recognize the conservative Anglo-Saxon side of the several subjects involved. We feel that there should be among those who are to represent America in this Convention at least one delegate who is known to be an earnest advocate for the preservation and rectification of Anglo-Saxon Metrology.

No less of a statesman than John Quincy Adams has warned us in sound and ringing words against the metric system.

No less of an astronomer than the Elder Herschel has thrust the sword of Scientific logic through the living principle of the French Metrology.

So practical a manufacturing establishment as that of Coleman Sellers, after twenty years of fair trial, has pronounced this system inconvenient, cumbersome and unreliable, and at great expense has abandoned a costly plant, and returned to one founded upon a standard which may be conveniently subdivided into common fractional parts in terms of unit inches.

An American Society of no less standing than that of the "Mechanical Engineers" has pronounced against this system by a vote so enormous as to almost represent the popular sentiment upon this subject.

In the meantime the people have made no complaints against the ancient weights and measures. They have found them always equal to the demands of what with the spread of Anglo-Saxon civilization over the globe, has actually now become an universal commerce. The commerce of the world, its industry, and its wealth are predominantly Anglo-Saxon, and are transacted in pints and pounds and inches. The entire business of all those nations which are now metric sinks into insignificance when compared with that of the English-speaking peoples taken collectively. Anglo-Saxon Metrology is in fact the *de facto* international or universal system of the world to-day.

There are but a few thousand scientific gentlemen in our country who are upon the metric side of this question. They are mostly men who are not engaged at all in *practical* affairs. Though many of them are leaders in the several professions, they are not men who labor at the bench, the forge, or at the plow.

In no sense of the word do they or can they represent the popular desires upon this subject. That it is a subject in which every individual citizen—man, woman and child—is deeply concerned cannot be doubted.

It took France (the mother of this system, a small part only of which has survived) forty years with compulsion at the helm to ride the sea of confusion which followed its introduction.

The expense which its introduction would entail upon this country is incalculable, the discomfort and inconvenience beyond conception.

It is a foreign system. The *people* have not asked for it. They have given no demonstration which shows they desire so radical a change. There are no advantages to result from this change. There are many disadvantages. It is linked to no traditions of our race. That it is modern is no argument in its favor, unless it is better than what we now use.

But it is not much better. For it originated in the mistaken idea that all meridians of the earth are equal. They are not so. It was miscalculated in length, as well as in manufacture, and therefore cannot be recovered if lost. It is thus as purely *arbitrary* as its advocates would have us believe our own standard to be. It claims to be founded upon cosmic principles, but it is in fact far less earth commensurable than our time-honored English inch. The latter can be recovered with greater accuracy than could the "Standard Metric Bar" now stowed away at Paris.

Metrology is a vast and growing question in political economy. It had far better be allowed to work out its own destiny in the market and the workshop than be allowed to depend for its development upon the mere theories of those *who persistently ignore the very history of the metre in foreign countries.*

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The decimal feature of the metric system is not one of universal advantage. This has been often shown, while, if it was, our own system admits of equally convenient decimal manipulation, both upward and downward, from the inch and the ounce, or from the foot and pound as units.

We will not attempt here to go over the arguments for and against the effort *to preserve and perfect our own system*, but take pleasure in submitting them herewith in another form.

We cannot allow a few mistaken, self-appointed, and unpractical men to commit our nation to a step which in our eyes would be like bartering our birthright for a mess of metric pottage, without making an honest effort to point out to what dire results the step will lead.

The publications of the International Institute are already quite voluminous. They consist of papers by many able men, and treat of the origin, the history, the preservation, and the perfection of our own system. Some of them at least are worthy of deep consideration at the bar of the nation's judgment.

They are at present in the form of suggestions even before our own Institute. It is as yet committed to no particular method of rectification, but is earnestly studying all that are submitted to it, and desires all fellow-citizens to examine with equal earnestness so great and serious a question.

This Institute enrolls among its members many earnest and able men, who may perhaps show our people good reasons for still maintaining their conservative position upon this matter.

The lamented President Garfield, your Excellency's predecessor, was its first elected president, and was a man devoted to its aims.

We submit herewith a list of our members, among which you will find the names of many well known to their countrymen, and would say in addition that numberless others are in sympathy with our object, though not yet enrolled in our comparatively young society.

Very respectfully,

For the Committee,

STEPHEN M. CHESTER, C.E.

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CONSTANTS.

[TAKEN FROM VEGA'S LOGARITHMIC TABLES.]

			LOG.
Base of Naperian logarithms,		$E = 2.7182818$	0.4342945
Log E = Modulus of common logarithms,		$M = 0.4342945$	$9.6377843 - 10$
Radius reduced to seconds,		206264.8	5.3144251
" " " minutes,		3437.7468	3.5362739
" " " degrees,		57.29578	1.7581226
360 degrees expressed in seconds,		1296000.	6.1126050
" " " minutes,		21600.	4.3344538
" " " degrees,		360.	2.5563025
Diameter 1, circumference,	π	$= 3.14159265$	0.4971499
	$\frac{1}{\pi}$	$= 0.3183099$	$9.5028501 - 10$
	π^2	$= 9.8696044$	0.9942997
	$\sqrt{\pi}$	$= 1.7724539$	0.2485749
	$\sqrt[3]{\frac{\pi}{6}}$	$=$	$9.9063329 - 10$

DIMENSIONS OF THE EARTH.

[ACCORDING TO BESSEL, TAKEN FROM VEGA'S TABLES.]

			LOG.
Semi-axis major	a	$= 3272077.14$ toises	6.5148235
" " minor	b	$= 3261139.33$ "	6.5133694
a in English feet		$= 20923597$	7.3206363
b " " "		$= 20853654$	7.3191822
a " " miles		$= 3962.8025$	3.5980024
b " " "		$= 3949.5557$	3.5965582

Ellipticity of meridian $= \frac{a-b}{a} = \frac{1}{299.1528}$ $7.5241069 - 10$

Excentricity of meridian $\sqrt{\frac{a^2-b^2}{a^2}} = 0.08169683 = \frac{1}{12.24038}$ $8.9122052 - 10$

LENGTH OF DEGREES OF LATITUDE IN FEET.

0° — 362,734	50° — 364,862
10° — 362,843	60° — 365,454
20° — 363,158	70° — 365,937
30° — 363,641	80° — 366,252
40° — 364,233	90° — 366,361

LENGTH OF POLAR AXIS BY VARIOUS AUTHORITIES.

(Clarke)	41,707,796 feet.
Russian	41,711,019 feet.
Indian	41,712,534 feet.
French	41,697,496 feet.

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MASSES OF THE PLANETS, THE SUN'S MASS BEING = I.

TAKEN FROM VEGA'S TABLES.

Mercury	$= \frac{1}{4865751}$ (Encke)	Jupiter	$= \frac{1}{1047.879}$ (Bessel)
Venus	$= \frac{1}{390000}$ (Le Verrier)	Saturn	$= \frac{1}{3501.6}$ (Bessel)
Earth	$= \frac{1}{354936}$ (Le Verrier)	Uranus	$= \frac{1}{24905}$ (Lamont)
Mars	$= \frac{1}{2680637}$ (Burckhardt)	Neptune	$= \frac{1}{18780}$ (Peirce)

Moon $= \frac{1}{79.667}$ of the mass of the earth (Hansen).

FURNISHED BY PROF. STOCKWELL.

Mass of Mars determined from the motions of its satellites by Hall, $\frac{1}{3093500}$

DENSITY OF THE EARTH.

Col. James, at Arthur's Seat, Edinburgh,	5.316
Carlini and Plano, at Mount Cenis,	4.950
Prof. Airy, England,	6.565
Cavendish,	5.480
Reich of Freiberg,	5.438
Reich of Freiberg,	5.882
Francis Baily,	5.660

MISCELLANEOUS.

TAKEN FROM VEGA'S TABLES.

Horizontal equatorial parallax of the sun (Encke) 8".57116 Log. 0.9330396

Distance of the earth from the sun = 95464768 English miles 7.9793886

Year according to Hansen and Oluffson	sidereal	365.2563582 mean days	2.5625978
	tropical	365.2422008 mean days	2.5625809

Precession according to Bessel = 50".21129 + 0.0002442926 t (epoch 1750)

Precession according to Struve = 50".2298 + 0.000226 t (epoch 1750)

Equatorial precession (Bessel)	m = 46".02824 + 0".000308645 t	n = 20".06442—0".0000970204 t
	(Struve) m = 46".0481 + 0".000284 t	n = 20".0650 —0".000086 t

Diurnal precession = 0."13759 (1856).

Aberration according to	Delambre	= 20".255
" "	Struve	= 20".4451
Nutation "	v. Lindenau	= 8".97707
" "	Peters	= 9".2231

Obliquity of the ecliptic: according to Struve (1750) 23° 28′ 17".44—0.4645 t; and Peters (1800) 23° 27′ 54".22

Light is propagated from the sun to the earth	according to Delambre in	493s. 198	2.6930213
	according to Struve in	497.827	2.6970785
Velocity of light per second	according to Delambre	193360.0 English miles	5.2863666
	according to Struve	191562.0 English miles	5.2823094
Attraction of the sun according to Gauss	K in parts of the radius	0.0172021	8.2355814—10
	K in seconds of arc	3548.18761	3.5500066

MEAN VALUES.

FURNISHED BY PROF. STOCKWELL.

Tropical year, 1850, in mean solar days,	365.242213655
Annual variation of tropical year,	0.0000000669

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Maximum length of tropical year,.....365.242783910
Minimum length of tropical year,.....365.241529283
Length of a lunation in 1850,..... 29.530588572
Maximum length of a lunation,..... 29.53153417
Minimum length of a lunation,..... 29.53053100

NOTE.—The figure and magnitude of the earth are easily deduced from two measured arcs of a meridian at different latitudes, the most favorable case being where one arc is situated at the equator and the other as nearly as possible to the pole.

RECENT DETERMINATIONS OF THE PARALLAX OF THE SUN.

FROM TRANSIT OF VENUS IN 1874.

1875	Pinseux,.....	8".879
1877	Lindsay and Gill,.....	8".765 or 8".815
1877	Airy,.....	8".760 or 8".754
1878	Stone,.....	8".884
1878	Tupman,.....	8".813

FROM TRANSIT OF VENUS 1882.

Hongean, Royal Observatory of Brussels,.....8".878

A LETTER TO COL. INGERSOLL.

66 WEST 4TH ST., NEW YORK, MAY 24, 1884.

HON. ROBERT G. INGERSOLL:

Dear Sir: I see in the *Truth Seeker* of New York (Saturday, April 26, 1884), 'A New Lecture by Col. Ingersoll.'

In the third paragraph you say: "There was a time when the astrologer sought to read in the stars the fate of men and nations. The astrologer has faded from the world, but the astronomer has taken his place."

I cannot believe that you, having always been an advocate of reason, freedom of thought and speech, and justice, would intentionally make a misstatement, or, having done so, would hesitate to retract it were you shown to be in error. I wish, therefore, to ask you, Are these your words, and where is your authority for saying the "astrologer has faded from the world," or do you of your own knowledge know it to be so?

You will excuse me for troubling you, but I am very much interested in such matters, and I think if you examine into the subject you will find that astrologers have not all faded from the world. It is true that they are not as common as they were centuries ago, but that is not for the reason that astrology has lost any of the truths it has always contained, but because of the bigoted theological element in the world which has endeavored to carry out the words of God in the Bible who is said to have told the children of Israel, "Thou shalt not suffer a witch to live," and the so-called civilized nations of late years have done everything possible to exterminate astrology, knowing not the difference between it and witchcraft.

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When the persecutions of astrologers have ceased, and the time comes when men will not be reviled, proscribed, or condemned for their belief in subjects that they have been compelled to admit to be true by rational and unbiased investigation, then you will find that the astrologer has not faded from the earth. You state, "The astronomer has taken his place." This is the first intimation I have ever had that astronomers have ever attempted to read the fate of men and nations. You speak of the great discovery in astronomy by Kepler, from which we may almost date the "birth of science." Are you aware that Kepler made equally as important discoveries in astrology? And "Kepler's Aspects," which he first discovered, will be known by his name equally as long as his first, second and third laws in astronomy.

Is it not strange that the ancients, who excelled in poetry, sculpture, mathematics, architecture, and also in astrology, putting it to the test every day for thousands of years, never discovered the falsity of it; while, in these days when very few persons know anything of the subject, every ignorant person supposes that astrology has been "exploded?" Probably you were not aware that for thousands of years all the calculations in astronomy were made for the sole and only use of astrologers, similar to the astronomical calculations of the present day being made almost solely for the purpose of navigation. The only person I have ever read, or heard tell of, that ever attempted, systematically, to explode astrology, was Bishop Butler, author of 'Analogy of Religions.' He wrote a number of articles against astrology, but finding he was so ignorant of the subject, it occurred to him that he could write against it with more advantage if he only understood the science. He began its study and ended up by writing one of the best works we have on the science, called 'Butler's Astrology.' Why has not his 'Astrology' been used as a text book in our universities, like his 'Analogy of Religions?' Simply because astrology is not fashionable in our day.

Yours respectfully,

L. D. BROUGHTON, M. D.

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LETTERS.

LETTER FROM F. A. R. WINTER.

DEMERARA, June 4th, 1884.

CHARLES LATIMER, ESQ.,

Dear Sir:—I have had the pleasure to own receipt of Miss Sanford's favor with documents and map and first number of the second volume of the STANDARD, and have now to acknowledge the second of May number. Enclosed you will please find three dollars for the cost of first volume of STANDARD, which you will oblige by forwarding. Would you kindly let me know the cost of a Pyramid thermometer and Fahrenheit combined? The STANDARD is a most interesting magazine to me, for I have for years blindly endeavored to fathom the mystery of the chronology of the Pyramid measures. The last numbers are especially acceptable, as I have now in Mr. Banks' hands a short paper on the correlation of Bible chronology with Pyramid measures, and I was in hopes of being in a position to send copies of it to you by this vessel, but am disappointed, not having heard from the gentleman who kindly took charge of my paper. I sent him corrected proofs quite in time to have heard ere this. My view is that the Bible chronology is in solar years as a thorough reckoning, but that there is a computation for short periods; that after Terah the shortened chronology is in calendar years, but going back from Terah to Peleg the intercalary years have to be added to the Bible record in calendar years; thus from Peleg to Shem the period embraced in the 215 inches or years of the doubled line of wall, the symbols here indicate not only a change of notation, but also a difference in length of year, for if we here double the intercalations and deal with the results as lunar years, we get the solar dates of the birth of Shem 2742 B. C., deluge 2628 B. C., in the double line of wall, thus accounting for all the specific measures in Our Inheritance from Exodus, 1542 B. C. Adding to this date for them 2742, 1656 — 114 = 1542 we get 4283 B. C. for Adam's creation—and I am pleased to see this strongly confirmed by Mr. Wood in his paper on the genealogical stones of the Pyramid, as well as by Mr. Reeves in his History of the Redemption. Mr. Wood's diagram on page 70, March number, gives the horizontal length of the ascending passage to the intersection with the descending passage as 3956 + but as this intersection is 215 + above the base line, we have a repetition of the 15 + concealed in the double line of wall. Now if the 215 + be produced in continuation of the descending passage at some angle, will it not increase the horizontal distance by about 204 inches, making the whole 4160? which is the date I bring out as the birth of Seth, the 126 years of Adam's period being merged in the measures in the passage to the subterranean chamber, and when this is added to 4160 we have 4286, a very close approximation to Mr. Reeves' deductions.

I fear this will be unintelligible to you in the absence of my paper, but in order to give you a clearer idea of my argument, I enclose some rough notes on the MS. sent to England with table. I got my 4809 from Hand book to the Bible, and I utilize it to show that the pre-Adamite measures are also to be found in this great record of Almighty foreknowledge. I am very strongly of opinion that using the π proportions in respect to these subterranean measures that they will be found to give the precessional period anterior to the first Pleiades year 2170 B. C., *e. g.*, the length from end of descending passage to entrance of subterranean chamber $\frac{224}{\pi} = 103 \times 5 = 515$. Breadth of sub-chamber

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$\frac{324}{\pi} = 103 \times 100 = 10300 + 515 = 10815$ from south wall of sub-chamber to end of descending passage; from thence say at birth of Seth to Isaac 2170 B. C. is $1990 + 10815 = 12805$, or half the precession of the equinoxes = one diagonal of the Pyramid, or say $324 - 126 = 198$ pre-Adamite years in sub-passage. $198 \times \pi \times 5 = 3110$ — breadth of sub-chamber $\frac{324}{\pi}$ $103 \times 200 = 20,600 + 2116$ from creation of Adam to birth of Isaac 2170 B. C. or Pleiades year $- 3110 + 20,600 \times 2116 = 25,846$, a full precession of the equinoxes. I am not a mathematician, but I am certain there is more in these approximations than appears on the surface. Cannot your more talented friends work out this idea? Wishing you success in your noble work, I am, my dear sir,

Yours in faith, F. A. R. WINTER.

The following table shows that the thorough chronology of the Bible agrees with the Anno Sacro thorough record in solar years. It also shows that the Pyramid measures are in close accordance with both, and further, that as indicated by the symbology of the doubled line of wall at the entrance to the descending passage of the Pyramid, there is a dual reckoning all through, and that when the intercalations, suggested by the sign placed against the ages of the several patriarchs, are supplied, they give the true date. Thus we find 637 Bible years from Exodus to birth of Isaac; these reduced from calendar to solar years give 628, the number of inches marked in the Pyramid; and from Isaac to Peleg the Bible record is 357 years, while the Pyramid requires 357 inches. Now if we supply the intercalations indicated, at the rate of one year for each patriarch, say 11, we shall have 362 calendar years equal to 367, the number of Pyramid inches required; the intercalated years being the exact difference found in the record from Exodus to Isaac; proving the duality of the Bible record from Exodus to the dispersion. This brings us to the entrance of the descending passage in the Pyramid, and here the doubled line of wall not only symbolizes the dual chronology, but marks a change in the mode of reckoning. In Genesis V, we have a period from Peleg to Noah's 500th year of 200 years. The double line of wall is 215 inches long. Now if we take the 11 intercalated years and double them, we shall have 223. Dealing with them as *lunar* years, we find them equal to 215 solar. One hundred years from Peleg to the end of the flood, and 115 years to the birth of Shem, including the duration of the flood, covering the exact measure of the double line of wall, giving 2,628 as the date of the deluge, and 2,742 as that of the birth of Shem. Here we must note the peculiarity of the division in the number of the intercalated years before and after the flood; in the latter period we have seven following in unbroken notation; in the former we have *one*, separated from the remaining three. This was not done without intention, but with design and purpose. It appears certain that the three ember numbers were intended to be cut off from the reckonings at some portion of the record, leaving eight to be computed. Applying this to the section now in hand, if we double these eight and add them to Noah's 500 years, we shall have $516 = 501$ solar years; there are 321 years back to Enos, add to them 16 years and we have 837 as lunar years = 812 solar. There are yet 105 years to the birth of Seth, adding the three remaining intercalations and we get 108 as lunar years = 105 solar, leaving Adam's era only to be dealt with. And as this period is covered by the passage to the subterranean chamber, we deal with the 100 years as lunar years without any additions, and we get 126 solar years; deducting these from the 324 inches of the passage length, there remains 198 years, and as the breadth of the subterranean chamber is 325 inches, the pre-adamite period is shown to be 523 years, the sum total being 4809 years.

One hand-book places the death of Herod the Great at 4806, and remarks that the nativity of our Lord is supposed to have taken place about this period, and begins the vulgar era at 4800.

Now if we take Noah's era at 1056 Bible years as calendar, they are equal to 1040 solar

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years, and 1040 years is a soli-lunar cycle—at which period all the reckonings coincide, and this appears a most appropriate time for the appearance of Noah, or *rest*. Now the number of years from birth of Seth to Noah is 4160 = to four Daniel cycles of 1040 years each—six of these cycles will end in 1950—1885. It cannot fail to strike the eye of Pyramid students that $\frac{2625}{100} = 26.28$, the angle of the descending passage, and as the length of that passage is shown by Mr. Latimer to be 4125, we have the king's chamber multiplied by 10.

LETTER FROM C. PIAZZI SMITH.

KURN HATTIN, HAVSTOCK, WINCHESTER, June 19, 1884.

My Dear Mr. Latimer:—I lately sent you a pithy anti-French metrical quotation from a private letter, on the back of a post-card. From another letter by the same party I now quote as follows:

"At school we were taught the king's English, *i. e.*, miles, yards, furlongs, feet, etc.; now, an unholy, Baalite, small sect, who think no small beer of themselves, try to force upon Englishmen such terms as centimetre, milligram, kilometre, etc., etc. All which terms convey *no meaning whatever* to an Englishman; and the people won't have it. 'No, not for Joe,' meaning, I suppose, Joseph, of whom Ephraim came.

"It is high time for active resistance to be made against these as well as other abuses which are sought to be imposed upon us. It is not for us to judge men, but I cannot help noticing that the greater part of the men who advocate these changes are not God-fearing men. I believe that Satan is making a last stand, and using every means in his power to blind those who are within his reach.

"There are in fact and truth, very, very few people in England who care to have the false French measures, and they belong to one set only. I will give every support in my power to aid in resisting such a movement. Prayer is a great weapon in our hands, necessary, as we are fighting against principalities and powers; but besides prayer we must use such other weapons as are available. A clergyman is not content only to pray for his people, he *works* among them. I do earnestly pray for and wish our good American cousins of the International Institute and INTERNATIONAL STANDARD every success."

Now who is the person who writes thus nobly, do you ask? He is Mr. J. Leyland Feilden, of Proppynden, Burwash, Sussex, the author of a little book published a few years ago entitled, 'Israel's Jubilee," and since then of a larger book entitled 'The Word, the World, the Branch,' wherein he sets forth a chronology indicating that the present year is in truth only 1880 A. D., and that the year 1882 of Israel's Jubilee is yet to come, and will be specially signalized; and he has much to say with regard to the site of Jerusalem, and the plans and purposes of the Great Pyramid. Further, while of Scandinavian descent he is a thorough English gentleman, living at his place in the country, but occupying himself *con-amore* with many questions both in science and religion. To him, then, I had sent a copy of my little book dedicated to the International Institute, viz: the 'New measures of the Great Pyramid, etc.,' and he was so much taken with the account there given of the International Institute, that he said that he must send them a subscription of £5. I gave him an opportunity of second thoughts on the subject, but that has made no difference, for in his second letter he has actually enclosed a check for £5, which I propose to take into Winchester on Monday, get cashed, then converted into a post-office order, I sent to you as President of International Institute, Cleveland, Ohio, U. S. A.

On going home, which may be in nine days now, I must see if I have a spare copy of

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any of Mr. L. Feilden's books to send you, and you may be sure that he will be glad to hear straight from you.

Yours truly,

C. PIAZZI SMITH

July 21, 1884.

P. S.—Alas! Poor dear Abbe Moigno is dead, with all his fine aspirations for science with God, as against science without God; and God the ruler of his own world, God in history and God in revelation.

C. P. S.

LETTER FROM F. HESS.

FORT DODGE, IOWA, August 8, 1884.

CHARLES LATIMER, President, Cleveland, Ohio.

Dear Sir: Your esteemed favors of the 18th and 19th ult., as well as your circular and a copy of 'New Measures of the Great Pyramid by a New Measurer,' reached here in due time, and would have received earlier attention but for a protracted absence from home and pressure of other business.

I shall take great pleasure in reading more carefully than I have so far been able to do Prof. C. Piazzi Smyth's just and generous criticism of Mr. Petrie's work at Jeezeh, which, when rightly applied, so gloriously confirms the very theories it was designed to overthrow, and shows how the wrath of man is made to praise the Lord.

I too, am very thankful to Mr. Flinders Petrie for unwittingly bringing out into clearer light also the luni-solar character of the Great Pyramid, and I now believe more firmly than ever that the very discrepancies between the different measures of the base lines, arising from different levels of the corner sockets, were designed to show the inequalities of the moon's motions, and the different lengths of the seasons of the year, as well as of the great equinoxial cycle, and, perhaps, of those of the still greater cycle of the solstices from pole to pole, comprising at the present rate of decrease in the obliquity of the ecliptic a period of some 2,590,000 years, or ten equinoxial cycles, with its long ages of a world's winter and summer, spring and autumn.

This seems to me suggested by the present slight deviation of the base lines of the Great Pyramid from a true meridian and prime vertical.

I have neither the time nor the inclination just now to wrestle with hair-splitting fractions, which I must leave to our mathematicians, begging them to fully investigate this luni-solar character of the Great Pyramid in the light of Mr. Petrie's new measures and the following simple equations, viz.:

25 common years = 309 lunations.

7 common years = 365 weeks = one Sabbatical cycle.

7 Sabbatical cycles + one sacred year of 377 days = 618 lunations + 12 days = 50 years = one jubilee cycle, typical of the final restitution of all things.

10 jubilee cycles plus one day = 500 tropical years, the average length of which = 365.2420 days = the length of the tropical year A. D., 5,000, etc.

Let them compare these numbers with the different lengths of the base lines of the Pyramid, with the dimensions of the queen's chamber upon the 25th course of masonry, and of the king's chamber upon the 50th course of masonry, and see what additional new harmonies they may discover there, and say whether the combined wisdom of modern science and modern religion can suggest a better chronology for a *novus ordo seclorum* than the one so plainly flowing from this hoary Altar and Pillar of Jehovah at Jeezeh into all the world.

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I should like to go further into details, but other more urgent duties claim my attention.

Some of our young men here manifest considerable interest in the work of the International Institute, and when I get a little more leisure I will send you another list of names. Those I have already sent you are not to be proposed for membership except at their own personal and direct request, upon renewal of their subscription to the INTERNATIONAL STANDARD for the coming year.

Very truly yours,

F. HESS.

LETTER FROM J. R. SKINNER.

110 BROADWAY, CINCINNATI, July 2, 1884.

My Dear Mr. Latimer: I received one copy of the Society's Magazine, and I want the second or duplicate copy, as I consider this the ablest and most important paper ever published on the Pyramid and its measures.

Now to the July number. I have been amazed. The combined effect of the several articles independently written caused such a feeling of gratification as I am unable to express. The convincing power of the combination seems irresistible, while, besides, there is a curious tendency toward coming together and agreement as to perplexities such as I have never yet seen, and which heretofore has seemed impossible, a rest from our weariness. Surely the Great Spirit is brooding providentially over the work.

(1) Comes P. Smyth with an astronomical value of great importance—viz., the tropical year of $365.^{21221}$. I have always held to this because Parker worked it from his ratio. Now Smyth confirms it by statement.

(2) In order, Dr. Redfield gets so hot as to his mention of Shechem, that if he but knew that which is supplementary to what he says he would get on fire with the discovery of an amazing matter.

Then (3) the two remarkable and telling papers of Mr. Dow, so well put and so unanswerable! Strange, however, when he finds such a use of the very terms of 648 : 206264.7 out of the form of 20612 : 6561 : : 648 : 206264.7 that he does not see the necessary connection. But his second paper is exquisite. Had I worked two years and discovered this relation, I should feel that I had found one more crown jewel. You wrote me about it, but I thought I would say nothing. But now please look at crown jewels at height from ground level, I believe, to intersection of floor line of grand gallery with vertical height, in inches diameter to 5184, as 1296×4, 5184 being indication of 5184000″, or 1 solar day of 24 hours, 5184 inches being 4 square yards of 1296 inches each. The top of this vertical height leads and connects with his development of same use in the totality of king's chamber. But this vertical height line is there seen to be connected with and in the area of 63360, or 5280×12, whose base side is $\sqrt{63360}$, connecting Mr. Dow's development with the British inch, foot, yard and mile measure in this area, thus bringing in support and confirmation of Rev. Mr. Wood's researches.

(4th) And next in order your superb resumé and discussion of the bases of measuring calculation and various application. My friend, you may be proud indeed of that article. Surely, surely, there is a God in Israel.

Besides these I have to notice the singular and valuable article of Mr. Faber, and the conservative and sound paper of Prof. Stockwell.

Such work tells of a power which must be felt, and must have great convincing weight and influence wherever it goes and is read.

It is true man proposes, but here it seems as if God was laying hold of the matter and

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was disposing. It is the cause of truth, wherefore we may rejoice in such leaders—strong in their strength.

Your friend,

J. R. SKINNER.

LETTER FROM PROFESSOR PIAZZI SMYTH.

KURN HATTIN, near Winchester, June 21, 1884.

My Dear Mr. Latimer: Your last enclosure with a reproduction of Mr. Osburn's portrait, and a commendable apology for Mr. Dow's hasty paper, have reached me here, where we have come for a few weeks; but you can still go on directing your letters to Edinburgh, where they are daily forwarded.

I had recently a long letter from Rev. Mr. Perry, and he communicated one from you to him, advising that I should be applied to for an idea of the expense to be incurred by the American expedition. I replied, if they do not yet know what they are going to do, how can I tell them what their unknown project will cost in doing? You must have a definite idea of all of what requires to be done, and then apply to some one more accustomed than I am to large works of co-operative schemes, and who knows Egypt as it is now.

One thing you have a firm conviction ought to be done, and ought to have been done long ago, viz: the connecting of Great Pyramid for longitude with the Venus Transit telegraph station of 1874 on the Mokattam hills. Make this the No. 1 of the programme of your coming expedition.

Next I would suggest, find out from F. Petrie's book something, probably a great deal, that should be checked by a new worker. He presumes greatly on his deduced or supposed limits of "probable error." But I never yet knew of any operation in applied science in which a second worker did not show that the first worker was three, six, or ten times more in error than what he had computed according to theory of probable errors.

You may perhaps be led to select some points of F. P.'s work, for this re-examination after you have seen my little book about it. The one hundred copies for the International Institute, through you, their president, are now sent off by the Smithsonian agent in London, to the Institution in Washington, to be forwarded to you in their parcel 14752, and that in case No. 635. For all that, however, I shall send off the first single copy, I hope to get next week, to you, per post, so that you may have an early look at it, in the above point of view.

I am expecting a visit from Egypt soon, from a Mr. James Hewat, son of a Mr. Hewat, late an Edinburgh citizen, whose scheme of the city having an electric fired time-gun, as well as an electric dropped time-ball, I took up and have maintained ever since as one of the duties of the Royal Observatory, Edinburgh.

Mr. James Hewat is an accountant, is delighted to hear of your probable visitation to him at Alexandria, Egypt; says he is the oldest British resident in Alexandria, dating years of residence there only, and will be delighted to give you and your party all the information and all the help in his power.

There is a Colonel A. T. Fraser, R. E., in Trichinepaly, Madras, superintending public works there, who writes to me every ten days or a fortnight on Pyramid and other such matters, and has done so ever since he passed through Egypt in 1881 and saw F. Petrie at work, and said, spite of the Vyse casing stones and pavement being within the line, that he thought the sockets at the corners looked more like what the ancient builder *intended* to make and be taken as the fiducial references for the size of the whole building.

I remain yours very truly,

PIAZZI SMYTH.

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LETTER FROM JOSEPH BAXENDELL.

SOUTHPORT, January 25, 1884.

CHARLES LATIMER, ESQ., C. E.

My Dear Sir:—Your letter of the 8th instant enclosing copy of Mr. Wood's letter has just come to hand, but as I have not yet received a copy of this month's number of the Magazine I cannot offer any remarks on the criticisms of Mr. Petrie's measures, or the results of Mr. Wood upon the cycloid and British mile.

With respect to Mr. Wood's criticism of my equation for the moon's mean period, I observe he has commenced by applying the sign $\sqrt{}$ to 40 $\frac{1}{2}$ as well as to 36525.95983 in the denominator of the first member of the equation, which of course has led him to the "something wrong."

Mr. Wood says that "if in the formula $\frac{\frac{1}{2}a}{d+d'}$ = sine 26° 17′, 26.47″ we let d = equatorial dia. and d′ = polar dia. we shall have $\frac{\frac{1}{2}a}{d+d'}$ = sine 26° 18′ 10″, which is nearer Professor Smyth's and his own "theoretical passage angle"; but the limiting value of the expression $\frac{\frac{1}{2}a}{d+d'}$ is exactly sine 26° 18′ 9.77″, and, therefore, "the theoretical passage angle" cannot have reference to the figure or dimensions of the earth, as no one will admit that its form is that of a true sphere having its polar equal to its equatorial diameter.

On the next page I give you a few relations of pyramid measures and numbers which may, perhaps, interest you and some of the members of your Society; and, awaiting the arrival of this month's STANDARD, I remain,

Yours sincerely,

JOSEPH BAXENDELL.

RELATIONS OF PYRAMID MEASURES AND NUMBERS.

The square root of the length of a diagonal of the base of the Pyramid = 113.636552.

113.636552 miles = 200,000 yards.

The square root of 200,000 = 447.2135.

447.2135 divided by 3 = 149.07117 = mean height of ante-chamber.

447.2135 divided by 4 = 111.80337 = height of western granite wainscot of ante-chamber.

The height of the king's chamber, 230.38868, multiplied by the mean height of the ante-chamber, 149.0712 = 34.344 × 1000.

The length of the grand gallery, 1881.6, multiplied by 50, and divided by the length of the great step 61 = 1542.295 = length of first ascending passage.

LETTER FROM L. F. HASKELL.

SAN FRANCISCO, August 6, 1884.

CHARLES LATIMER, ESQ.:

My Dear Sir: In reply to your favor of the 19th ult., and circular just received, I enclose one dollar to help on the good cause, and wish I were in a position to do much more for it.

I believe you are doing a good and great work, and I hope that no obstacles, however great, will discourage you. I admire your devotion and enthusiasm, and these are what accomplish results. I think you should feel greatly encouraged that the Institute can muster six hundred names as members already, but I hope this is only a beginning and that you may see the interest in it so general, that not only will the Magazine be amply supported, but when the time comes definite and right action may be had in perfecting

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our system of weights and measures; but we want to be sure that the action is right before it is taken. Do not be in a hurry about doing this. With very best wishes,

L. F. HASKELL.

LETTER FROM SARAH PLUMPTRE.

EWELME, WALLINGFORD, July 17, 1884.

Dear Mr. Latimer: I am deeply interested in your letter, and in the contents of the Magazine. I really seem to read it next to my Bible, and I only wish I could further the cause far more than I can. I try to interest every one I can, but many laugh at it, and few are able to grasp the subject and grapple with it. I know so few scientific men. Mr. Godwin, perhaps, I have helped to bring you, but he was interested in the subject as early as I was, from his love for and his appreciation of Mr. Taylor, and I think he first took the manuscript of 'The Great Pyramid' to Mr. Taylor's publisher.

If there is yet time, cannot steps be taken to make *well* known amongst scientific men the great struggle coming on at Washington, the need for all to take their part?

I hope the universal meridian will be the Great Pyramid.

If I may venture to make a remark, I would avoid if I were you letting the Magazine bear any political complexion. Doubtless most persons in America are Democrats, while most persons in England are, I hope, ardently attached to a constitutional monarchy. I know I am, and I would die any day for the dear queen.

I write hurriedly; pray excuse it, and believe me,

Very sincerely yours, SARAH PLUMPTRE.

LETTER FROM E. P. INGERSOLL.

ROSEVALE, CLAY CO., KANSAS, AUGUST 5, 1884.

CHARLES LATIMER, C. E. CLEVELAND, O.

My Dear Brother:—I thank you much for the little book of Prof. Smyth's 'New Measures,' etc., which came in company of the back numbers of the INTERNATIONAL STANDARD. How triumphantly Prof. Smyth has vindicated himself and all his great work touching the Great Pyramid. Yes, error can never stand the conflict with truth any more than darkness can with the blaze of light.

I am glad to learn that the plan of sending an exploration party to Egypt is likely to be acomplished. If I had the means I would defray the whole expense myself, rather than that the work should fail. I hope, therefore, we shall soon hear of the departure of this expedition, with you yourself at the head of it.

In love,

E. P. INGERSOLL.

EXTRACT OF LETTER FROM REV. W. COOKE, D. D., TO PIAZZI SMYTH.

LONDON, June 21, 1884.

I have read with grateful interest your work on the 'New Measures at the Great Pyramid,' and present my warmest thanks to the esteemed and gifted author. It is Christian in spirit and quite conclusive in argument, in reply to Mr. F. Petrie. Indeed Mr. Petrie's findings corroborate for the most part the bases of your argument, and if his mind were not perverted by foregone conclusions, the remarkable coincidences between his findings

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and yours would have extorted from him an acknowledgement that the several commensurabilities, both externally and internally, between the Great Pyramid and the mathematical phenomena of the universe, were at least wonderful, and that *until* some other explanatory reason could be given for the scientific structure of the Pyramid, those which you assign should be regarded as worthy of the profoundest investigation by the most advanced philosophers of the day. For my own part Mr. Petrie's findings strengthen your scientific arguments.

I am glad to observe how you have kept your pen under restraint, even when there was just occasion for a degree of severity. All the better for your argument ; for truth does not need ridicule, though error often deserves it.

You have done well to reprint the admirable paper of the Rev. H. G. Wood. Its logical, philosopical and mathematical arguments form an excellent appendix to your facts and your discoveries.

Accept my grateful thanks. You have indeed done great service to the cause of truth.

Yours most faithfullv,

(Signed) WILLIAM COOKE.

EXTRACT FROM LETTER OF REV. JEVONS J. M. PERRY, M. A., TO PIAZZI SMYTH.

ST. PAUL'S VICARAGE, ALNWICK, NORTHUMBERLAND, JULY 2, 1884.

Let me thank you most sincerely for your charming little book on the Great Pyramid, which has interested me extremely, especially part iv, chapter 4. Our blessed Lord's return in glory is my hope and desire, as it ought to be of every Christian man ; and if, among other astronomical marvels, the Great Pyramid gives us warning of the approach of that blessed day, we cannot but be thankful for its teachings.

COPY OF LETTER FROM REV. DR. MACKAY TO PIAZZI SMYTH.

VENTNOR, ISLE OF WIGHT, June 28th, 1884.

My Dear Prof. Smyth : Please accept of my warm thanks for the valuable little book you have just sent me—' New Measures of the Great Pyramid by a New Measurer.'

I am very glad to have it, for it has very greatly relieved my mind in regard to many things on which Mr. W. F. Petrie had thrown some doubt. Your reply, thank God, is really triumphant, more especially as supplemented by the Rev. Mr. Wood's admirable paper "on the present state of the base side length." In that paper he gives very cogent reasons for holding that the sockets, and not the pavement, are the all and in all of the Great Pyramid. I earnestly hope the Americans will soon put into execution the noble purpose announced at page 101. When this is done, the testimony of the Pyramid must be complete.

On most points Mr. Petrie has been met ably and honestly, and you have shown a noble spirit towards your subtle antagonist all throughout. You have emerged triumphantly from this last, and by far most skilfully planned attack that has ever been made on your great work ; and my hope and prayer is that God may prolong your life to see the top-stone placed on your life labor. And I am yours, very faithfully,

(Signed)

ALEX. MACKAY.

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LETTER FROM E. P. INGERSOLL.

ROSEVALE, KANSAS, August 12, 1884.

CHARLES LATIMER :

My Dear Brother : I use this term in more senses than one; in these two, at least : (1.) a brother in Christ; (2.) a brother in the pursuit of exact knowledge respecting the Pyramid. It is in this last sense I desire now to write.

I have found the July number of the INTERNATIONAL STANDARD, an exceedingly interesting one, because it deals in facts and established truths, all except Dr. Redfield's article. I have read his article with all the care I can bring to bear on the subject, and still I have to say, where is the evidence that Joseph ever had anything to do with the Great Pyramid? But especially, what shadow of evidence is there that Joseph's embalmed body ever lay in that wondrous coffer? Surely, the Scriptures make no allusion to the subject in that direction, and history—what does history say? If there is any such history where shall it be found but in Egypt? Who has ever seen that history?—let him speak. Again, what saith the Pyramid itself? Where is the entrance through which the bearers brought that sacred body? What does Dr. Redfield say? He *supposes*, if I have read correctly, that they must have entered by some subterranean passage, and thence ascended up the "well;" thence up the grand gallery till they reached the king's chamber. But how does this look to you, my dear brother? What is the evidence of it? Can we credit such a supposition without the first ray of evidence hitherto adduced? Especially when we encounter obstacles that throw all those met by infidels about the Bible utterly in the shade. By the doctor's theory they entered by a subterranean passage, in the solid rock, an hundred feet below the base!! Thence they ascended up that crooked, zig-zag, perpendicular "well-passage!!" And when they came to the ante-chamber, what then? Well, let the Doctor answer. So, also, in taking the "bones of Joseph" out of the Pyramid, how did they manage. Did they go out as they came in? Who can tell?

Now is this the ground we have to work upon, to prove the divine inspiration of the Pyramid, and of its wonderful structure throughout! If so, I utterly despair of ever seeing that thing accomplished. It seems to me that the reading of the article on "The Altar and Pillar to Jehovah" must repel every one, whose mind is already established. How the doctor could ever have got that idea into his head, I cannot conceive.

No, I think when we bring forward theories, or rather I should say hypotheses, which when worked out are found to rest on fancy only, we shall never get ahead, whatever else we may do. I have found, in advocating the cause of the Great Pyramid, and also the identity of the Anglo-Saxon with Israel, *facts, known facts*, which are founded on history and reason, are the only weapons I can use in this warfare against Satan and his hosts. For is not everything opposed to the truth originated by Satan? Is not he the father of lies? And he can be met by truth, by truth alone, and not by fancy.

Now, my brother, I have no fears as to the final result of this great controversy, no more than I have that God will die. The evidence is, to me, as clear that this Great Pyramid was built by divine inspiration, as that the Bible was divinely inspired. That the builder of the Pyramid, whoever he was, was inspired, as certainly as Moses was inspired to write the Pentateuch. For, in both cases, the work performed was beyond the powers of all human beings combined. Why should I doubt then? God promised that he would fulfil the covenant made with Abraham: that his seed should become like the sands of the sea for multitude; that kings should come out of his loins; that Israel should become a nation of great power and wealth, "lend to many and borrow of none." To Ephraim it was promised that he should become a multitude of nations; and Manasseh a great nation. These things, these promises, are now fulfilled up to the present time (especially the two last), so that the crossing of a "t," or the dotting of an "i," cannot be found wanting. And will not God—the same God—bring to light all truth con-

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tained in the Pyramid? Indeed is He not now summoning His "witnesses" to testify before the world to the great truths imbedded in the great monument of stone?

E. P. INGERSOLL.

P. S.—I hope I may be permitted to meet with you at one of your fortnightly meetings ere long.

LETTER FROM EPH. M. EPSTEIN M. D.

VERMILLION, D. T., JUNE, 29, 1884.

My Dear Mr. Latimer:—I take the pleasure of replying to yours of the 17th inst., and begin by replying to the second part of your letter.

(1). The Ensign and Banner of the Common Version have in the Hebrew two terms: "Nai S" and "De Ge L."

"Nai S" occurs in the following passage:

Exod. xvii., 15,16.—"And Moses built an altar and called his name Ja H Ve H of my Nai S;" (in Heb. "Ja H Ve H Ni Si J,") for he said: "For (the) hand is on the seat of Ja H, (the symbolic bodily attitude during an oath, compare Genes. xxiv., 2), there is war unto Ja H Veh against Amalek from generation of generation."

Numb. xxi., 8, 9.—"And Ja H Ve H said unto Moses: Make thee a Se Ra F, and put him upon a Nai S; and it shall come to pass, that every one who is bitten, and should see him, and should live. And Moses made a serpent of copper, and put him upon the 'Nai S.'" (I suppose this Nai S, flag, was the most notable one in front of the chief commanders tent.)

Numb. xxvi., 10, 11.—"And the earth opened her mouth and swallowed them up, and Korah also, in the dying of the congregation, when the fire consumed the 250 men; and they were for a Nai S—(an outstanding mircale). But the sons of Korah died not"—(a singular escape).

Ps lx., 6—"Thou hast given to Thy fearing ones, a Nai S—(flag—banner—ensign) to rally themselves together, because of separation."

Isaiah v., 26.—"And he shall lift up a Nai S to the nations, (i. e., give a signal to all but only one will act upon it), and he will speak unto him, and behold, quickly, lightly he will come."

Isaiah xi., 10.—"And it shall come to pass in that day, that the root of Iishai, which stands for a Nai S of (the) Nations, unto him shall the nations inquire, and his repose shall be glory."

Ibid. 12.—"And I will lift up the Nai S unto the nations, and gather the cast-away-ones of Israel, and the scattered ones of Judah he will pick up from the four skirts of the earth."

(In the above three passages the prophet speaks of what we would call "An International Banner," or a "Nations' Banner.")

Isaiah xiii., 2.—"Upon the evening mountain lift ye up a Nai S. Raise ye a voice unto them, wave ye a hand, and let them come into the doors of the generous ones, (i. e., noble in actions)."

Isaiah xviii, 3.—"All ye settlers of the world and dwellers of earth, ye shall see when the Nai S of the mountain will be lifted up, and when the horn-trumpet shall peal ye shall hear."

(But you and the whole chapter deserve that I should translate the whole of it, adding brief remarks. (1). "Ho, land buzzing with wings!" (*i. e.*, where there is an unusual amount of insects and birds, compared with other lands) where there is an unusual amount of quadrupeds and reptiles, "which is situated from opposite to the streams of

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Cush!"—(Africa, *i. e.*, the southern part of the American continent). (2). O thou sender of forerunners in the sea, and with vessels of rushes, (*i. e.*, light boats) upon the faces of waters!" (Spanish early explorers of America,) "Go, ye swift messengers to a people pulled apart and plucked, (the Indians), to a folk terrible, (but) from now and onward a people of streak and streak, and trodden down, whose land adventurers have despoiled." (The So-American Indians). (3). "All ye settlers of the world and dwellers of earth when the Nai S of the mountains shall be lifted up, (then) ye shall see, and when the horn-trumpet shall peal, (then) shall ye hear. (4). For thus saith Ja H Ve H to me; I will be quiet, and will look at it in my habitation; as (in) pure warmth by (genial) light, as (in) a cloud of dew in the heat of the cutting time—(vintage). (5). For before the cutting time, when the blossom had completed, and the ripening grape had had her flower, and the pruner had removed (and) cast aside the useless and cast off (branches) with cut-shears, (6). they (indeed) together shall be abandoned to the hawk of the mountains, and to cattle of the land; and the hawk shall disgust himself upon it, and all the cattle of the land shall defile itself upon it." (i. e., when the worldly people shall have had their disgustful fill upon the useless, cut off members of American society outside of the people of the Lord). (7). "At that time there shall be carried a present unto Ja H Ve H of Hosts, a people (also) pulled apart and plucked, and (some) from (that) people terrible, (but) from that time and onward a nation of streak and streak, whose land adventurers have despoiled unto the place of the name of Ja H Ve H of hosts, (even) Mount Zion." (i. e., the return of Israel and Judah to the Lord and to Zion takes place after the discovery and Christianization of America. My friend, there is neither fancy nor forcing in this interpretation and translation. Simple history is my faithful interpreting guide).

Isaiah xxx: 17. "One thousand before the threat of one, before the threats of five ye shall flee, until that ye shall remain like a mast upon the mountain top, and as a Nai S upon the height."

Isaiah xxxiii: 23. Thy sailors (rope handlers, from "sail" a rope, in German), have forsaken (thee), they will not fasten properly their mast, they have not unfurled a Nai S (flag); then was the great booty divided, until the (very) lame ones robbed spoil."

Isaiah xlix: 22, "Thus saith the Lord JaHVeH, Behold I will bear up my hand unto the nations, and unto the folks my Nai S and they shall bring thy sons in (their) skirt, and thy daughters upon the shoulder shall be carried" (*i. e.* in sedan chairs, compare Numbers vii: ix, with Numbers iv: 10–12, and xiii, 23).

Isaiah lxii: 10, "Pass ye, pass ye, through the gates! Clear ye (*i. e.* who are inside of Zion), the road of the people! Cast ye up! Cast ye up the upward causeway! Clear it out of stone! Lift up a NaiS unto the folks!" (*i. e.* the different returning families).

You will notice that the consonants of NaiS are the same as are *sounded* in the word "sign," only they are read transposed. The letter "g" is likely more primitive than its omission in the Hebrew.

The word "ancient" is derived from "anteannus"—former year; the *t* before the *e* becoming softened into an S sound, ancient—antient. It has nothing to do with "ensign," which is from the Latin "insigno," where the "in" has the meaning of instrumentality, whereby a thing is done. The Hebrew for "ancient of days," is "Jhatik yomain," where the first word is the same as the Latin "antiquus."

The other Hebrew word for banner, viz: DeGeh, seems to denote a private flag. It is found in connection with the tribes in their march through the wilderness. Also in Ps. xx: 6, "We will sing about thy salvation (of us), and with the name of our ALoHIM we will bebanner ourselves." Also in Canticles ii: 14, "and his banner over me was love." Ibid. v: 10 "My friend is pure and ruddy; banner-like uplifted from ten thousand." Ibid. vi: 4, "Awe-inspiring as bannered host."

Of the signification of the Fleur de lis I know nothing, but would suggest the possible derivation from Fleur del Isis, or Fleur del Ulyss. This may bring it nearer in connection

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with the Labarum cross, and the four main petals of the corolla of the Lotus, which in Hebrew would be Lo T = 39, hence either 3 + 9 = 2 × 6, or 3 × 9 = 27, but to 60 or 600 I see no connection.

I have thus given you, with great pleasure, all that I could collect with my present scanty means of research. The translations are all from the original Hebrew, and without even a look into any version. Perhaps you may find something useful to you in them.

As to the tabernacle, I received a very flattering letter from P. Smyth telling me that a new society in Ireland began to study the tabernacle, and asking him about it, he referred them to my key as the best authority. I answered him, and stated my longing to exhibit a perfect model of it to the world. I can not help believing yet that this exhibition would be a service unto the Lord, in and with which I would be glad to close my earthly life.

The good Lord be with you and yours. Yours,

EPH. M. EPSTEIN, M. D.

LETTER FROM W. F. ALLEN.

NEW YORK, July 28, 1884.

"The testimony of all persons, without exception, with whom I have come in contact, either in person or by correspondence, has been that wherever the cities have followed the example set by the railroad companies and adopted standard time, not the slightest inconvenience has followed. I have been able to supplement the information on this subject received through a quite extensive correspondence, by an examination of local newspapers from widely separated parts of the country received at this office. No city has returned to local time after really adopting standard time. Louisville partially adopted it; the mayor ordered the city clock changed and the common council ordered it changed back again, other clocks in the city not having been changed. A question of authority was raised and the mayor submitted. While I have no positive information as to this action, I have seen it stated that personal feeling had something to do with the matter.

"On the other hand, the city of Omaha adopted standard time on May 1, 1884. In examining a list of the cities of over 10,000 inhabitants in the United States, I find that 185 out of 229 use standard time. Of those that do not, Ohio furnishes 15, Michigan 8, and the Pacific Coast 8, the rest being scattering. As to the railways the situation is entirely satisfactory. All railroads east of Ogden, Utah; The Needles; Deming, N. M., are using standard time except the two local roads at Pittsburgh, which aggregate about 20 miles in length. Standard time is used on the Northern and Canadian Pacific Railroads for their entire lengths, and by all roads in Washington and Oregon. The only notable exceptions in the entire country are the Central and Southern Pacific Railroads and branches or connecting lines in Utah, Nevada and California. Even the Southern Pacific uses standard time between Deming and El Paso. The railroads in the maritime provinces use Eastern standard time. The city of Halifax uses the time of the 60th meridian. To sum up for the railways, out of about one hundred and twenty-five thousand miles now in operation in this country and Canada, all with the exception of barely four thousand (4,000) miles are being operated by standard time. I have yet to hear the first intimamation from any railway official (and I think I should have heard) that the new system does not work with entire satisfaction, nor has any proposition been made to return to local time.

"Of course, the best results have not been secured where the times of cities have not also been changed.

You are probably aware that by act of Congress duly approved by the President,

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standard time governs the city of Washington and the District of Columbia. In the city of Boston, Judge Holmes, of the Supreme Court of Massachusetts, decided in a case brought before him that standard time, being generally in use, was legal time. In Savannah, where the change was 36 minutes, the largest employer of day labor opens his shop at 6:30 A. M. and closes at 5:30 P. M., and not the slightest confusion or trouble has been caused thereby. I mention this, not as an isolated case, for there are probably many such, but because it happened to come under my own observation. Since absolutely accurate local time cannot be kept, except by a fixed object, we must use one or another standard. One govering a limited area may be used if one's ideas or business are limited, but to such persons the use of one or another standard would make no practical difference. But since some arbitrary standard must be used in any case, it appears merely common sense that as many as possible should use the same standard. You may ask then: "Why not use a single standard for the whole country?" The answer is that so radical a change is not necessary. If the minutes agree everywhere the hours may have an agreed difference, which all can readily understand. Besides, there was no precedent for such a radical change, while there were a number of cases existing before standard time was adopted where the time used differed from local time by half an hour or more without inconvenience to those who used it. The experience of those who have adopted standard time is simply confirmatory of this. Some object because the hours of labor will be interfered with. The old hours of 7 to 6 have long since ceased to govern the labor of this city, because found inconvenient, and various other times have been substituted. The labor question will settle itself, as all questions relating to time keeping must be settled, and that is on the basis of convenience to the larger number."

W. F. ALLEN.

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TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

JUNE 18, 1884.

At the meeting Martin Coryell, C. E., Lambertville, New Jersey; F. G. Darlington and Henry Snyder, Pittsburgh, Pennsylvania; John W. Durkee, Bowling Green, Kentucky; A. A. Folsom, Boston, Massachusetts; Rev. L. B. Hartman, Hon. H. S. Little, Lewis Parker and Rev. Samuel Studdiford, Trenton, New Jersey; Dr. F. O. Nodine, Cleveland, Ohio; John MacLeod, Louisville, Kentucky; Dr. C. G. MacManus, Brownsville, Texas; W. L. Nicoll, New York; and John B. Kellogg, E. Coombs and Mr. Burbage, Washington, D. C., were elected members.

After the routine of business, the report of the Special Committee on Standard Time, of the American Society of Civil Engineers, was discussed. The report of the Chairman, Sandford Fleming, read at the recent Convention in Buffalo, stated that a number of questions bearing on the whole subject were submitted to men in prominent positions in the railway world throughout the United States and Canada. Ninety-two per cent. of those heard from gave their unqualified support to the proposal to abandon the old traditional division of the day into halves of twelve hours each, and to adopt a single series of hours from midnight to midnight, numbered from one to twenty-four.

Mr. Latimer stated that he approved of the 24 o'clock system, but objected to counting from midnight to midnight, as that idea is promulgated with the object of calculating from the meridian that passes through Behring's Strait, and which is wholly in the ocean.

Mr. Latimer said that railroad and steamboat time should all be counted from astronomical time from 0 to 24 hours, the prime meridian being fixed upon the Great Pyramid of Gheezeh, a monument which has lasted for more than four thousand years, and will last, thus: All the people living on the longitude of the Great Pyramid and half an hour or 7°.5 on each side would have the universal time, and would use but two hands to their clocks and watches. The people living at 15° west and 7.5° each side of that meridian would have Pyramid time and another hand to mark local time, which would be just one hour earlier than Pyramid time, agreeing, however, exactly in minutes and seconds, the people of 30° west and 7.5° on each side would have for local time a hand differing exactly two hours from universal time, and so on around the earth; the difference between the hour hands would at once give the longitude. Every watch and clock on this planet should show Pyramid time, have minutes and seconds for railroad and steamship time, and a third hand should be added to show local time, suited, of course, to the twenty-four meridians around the globe; but every person on the globe would have the same hour, minute and second for recording the arrival and departure of all steamboats and railroad trains in the world.

In conformity with an act of Congress, the President has called an International Conference to be held at Washington, on the 1st of October next. The Conference will endeavor to establish a prime meridian as a zero for reckoning time and for the computation of longitude. It would appear that at the Geodetic Conference which took place in Rome last October a sop was thrown to England and America in order to secure for the pride of France the adoption of the metric system. The meridian of Greenwich was recommended for adoption as the prime of the world; but the hope was expressed that if the entire world should agree to accept the meridian of Greenwich as the point of departure Great Britain would find a motive on her side to make a move in favor of the

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unification of weights and measures in adhering to the Conventiou of the metre of May, 1875. The approval of the proposal of the United States for a special conference in Washington was probably a concession merely as a means to secure the ends of the metric men. The act of Congress has authorized the appointment of three delegates for the United States to the Conference to be held October, 1884. A Committee of three was appointed by the President of the International Institute to consider what steps should be taken to have the interests of anti-metric advocates represented.

Rev. H. G. Wood, of Sharon, Pennsylvania, was introduced by the President at the close of the discussion. He gave an exposition of his paper on the subject 'Genealogical Stones in the Great Pyramid.' He showed some remarkable coincidences depending upon the order and position of the courses and floor stones already determined in the Pyramid and the order and number of generations from Adam to Christ as they are given in the first chapter of St. Matthew. Mr. Wood held the rapt attention of his audience, and at the close of his remarks a vote of thanks was passed, and the hope expressed that he would lecture before the Society at an early period.

A general discussion then took place, after which the meeting adjourned till July 2d.

JULY 2, 1884.

The attendance at the meeting evinced the increasing interest manifested in the objects of the society. Seth Dean, Glenwood, Iowa, and H. Darlington, Allegheny, Pennsylvania, were elected members. The Rev. Jevons J. M. Perry Alnwick, England, wrote with reference to the proposed expedition to Egypt, the probable expenses and the work to be accomplished. Theodore Gribi, Elgin, Illinois, wrote respecting the International Conference to be held in Washington in October. He says: "I am looking forward to the International Conference on standard time and meridian with great interest, and I think it very important that we should make a decided effort to make our voice heard there. But first of all, we must seek the sympathy and co-operation of the American Society of Civil Engineers. It seems to me that society should be able to exert a great influence. We should have resolutions printed and supported by the ground on which they are made, and circulated freely among all the members of Congress. Our course will win among all honest men if it is rightly understood. But politicians, as a rule, are comparatively ignorant on the subject, and many of them are easily swayed by what comes from exalted positions, unless they are able to judge for themselves. For this reason they ought to be provided with ample literature on the subject, with an urgent appeal from acquaintances or influential men to look into the merits of our course and the demerits of that which the foreign delegates will urge. Even if the International Congress should pass resolution in favor of the metric system—which is all they could do—it would still require legislative action on the part of our House of Representatives before it could become a law, and all we need to accomplish is the prevention of this. I am inclined to think that the majority of our legislators, professors and engineers are too sensible to be moved to the adoption or even advocacy of the French system, and then the mass of our people and particularly the manufacturers and owners of machine shops who would have to defray the expense of the change, will surely be consulted first and have something to say."

Mr. Gribi's letter was followed by one from Professor Piazzi Smyth, and Mr. Latimer announced that in consequence of the address to be made other important communications would be reserved for the next meeting. Mr. A. M. Searles then read a paper from Mr. George C. Davies, whose impaired health prevented his attendance. Mr. Davies paper was addressed to the metrologists of the institute, and was a plea for simplicity of terms. He says that some of the metrologists of the institute seem to think that an ideal system must be evolved from the old, forgetting that the mission of the society is to "preserve and perfect" the weights and measures in use. He says, "Could the society realize the fact that the easiest and shortest way to dispose of the Freneh metric system will be to memorialize Congress to make the Anglo Saxon weights and measures the legal and only

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standards of the country, I think we should cease to hear of the French metric system and its zealous advocates, for we have the people with us."

Rev. H. G. Wood then read an able paper refuting many of the arguments of President Barnard in his articles on the Pyramid, in "The School of Mines Quarterly." At the conclusion of Mr. Wood's paper, Mr. Latimer read a letter addressed to President Barnard, asking for a public discussion of the subject by three representatives from each side.

Mr. Joslin, who had requested to speak at this meeting, then took the floor. His most important point was the correction of the calendar, which, in his opinion, will fully settle the question of time which is now being discussed by scientists.

The meeting then adjourned for two weeks.

JULY 16, 1884.

At the usual fortnightly meeting of the society the following persons were elected members: F. W. Newman, Dresden, Germany; Alexander Hudunt, New York; Henry W. Bigelow, Toledo, Ohio; Dr. J. D. Buck, S. H. Randall, Dr. John Wiggins, Rev. Henry D. Moore, Dr. J. H. Hunt and Charles C. Wood, C. E., all of Cincinnati.

A resolution was passed thanking Professor Smyth for the honor he had conferred on the institute by dedicating to it his new book 'New Measures of the Great Pyramids by a New Measurer,' and for the copies received for distribution to the members.

Mr. F. A. R. Winter, of Georgetown, British Guiana, in a letter which was next read, endeavored to prove that the thorough chronology of the Bible agrees with the Anglo-Sacro thorough record in solar years; and showed that the pyramid measures are in close accordance with both, and further, that as indicated by the symbology of the doubled line to the descending passage of the pyramid, there is a dual reckoning all through, and when the intercalations suggested by the sign placed against the ages of the several patriarchs are supplied, they give the true date.

Letters were also read from Professor Smyth, Royal Astronomer for Scotland; Abbe F. Moigno, Paris, France; Professor R. Kelso Carter, Pennsylvania Military Academy, Chester, Pennsylvania; Professor Theodore Gribi, Elgin, Illinois; Emili Low, C. E., Pittsburgh, and F. Hess, Fort Dodge, Iowa.

On account of limited time the reading of valuable letters from J. R. Skinner, of Cincinnati, and others, was postponed for a future meeting.

The paper of the evening—'Some Objections to the French System of Metrics,' by Jacob M. Clark, C. E., of New York, was then read by Mr. William H. Searles, C. E.

Mr. Clark's principal objections to the system are:

First—It is not a scientific system, violating in its fundamental idea the principle that direct and square measure cannot be logically expressed by a curved line. Again, the system is simply a geographical measure based on a very imperfect division of the circle.

Second—The difficulties attending its introduction, the people being opposed to it in places where introduced and its lack of native popularity.

Third—The advocates of this change in our own country are mainly non-practical men—professors, chemists, some druggists, and the like—to whom the convenience of decimal reckoning outweighs the far greater one of manipulation in engineering, surveying, and the constructive arts; or else those who from foreign training or motives of interest desire a change. If saving of labor is to be sought, experience in handling the measures in the broader and more important works of man might effectually change their views.

The testimony of such experts as Mr. Coleman Sellers, one of the most prominent manufacturers of iron machinery, and others like him, who have tried the French system for years at great expense in their own works only to regret it as inconvenient, together with the almost universal feeling of American architects, engineers and builders, so far as the writer can judge from an extensive acquaintance, is decidedly against the attempt.

Mr. Clark in closing presents a metric or decimal system with the English inch, and the Arabian gauge or guz (equal to 25 English inches), each increased by its 1-1000 part a

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units. The paper was discussed at some length, after which the meeting adjourned for two weeks.

JULY 30, 1884.

Notwithstanding the inclement weather the last meeting of the society was largely attended. Members were elected as follows: James A. Collins and William Archer, C. E., of Cincinnati, and C. N. Dubbs, C. W. Fell and Frederick G. Roeder, of Cleveland. Rev. Gustave Seyffarth, Phd. D. D., etc., Yorkville, N. Y., was elected an honorary member.

The Chairman announced the death of L'Abbe Moigno on the 17th instant, and read a brief biographical sketch from the Paris *Le Figaro.*

An article in the New York *Herald*, by Joseph Baxendell, English astronomer, criticising Professor Barnard's new book, was then read.

In reference to the successful working of the new system of standard time, Mr. W. F. Allen, editor of the "Travelers' Official Railway Guide," wrote the Society that of the 125,000 miles of railroad in the country, all with the exception of about 4,000 miles were operated on standard time, and that it worked very satisfactorily, although the best results were attained in cities which had adopted it; and stated that of the 229 first-class cities in the United States, 185 had adopted standard time.

The remainder of the evening was taken up in discussing standard time and prime meridian, Messrs. Samuel Beswick, C. E., of Canada, Rev. H. G. Wood, of Sharon, Mr. Robert French, chief engineer Mt. V. & C. Railway, Professor Stockwell and others taking part in the discussion.

Letters were also read from Mrs. Plumptre, of England, and Mr. W. McAllister, of New York.

Meeting was then adjourned for two weeks.

AUGUST 13, 1884.

Rev. H. G. Wood read a paper on 'The Correlation of Anglo-Saxon Measures,' which exhibited some new and most interesting features of the Pyramid.

Mr. Wood also made a few remarks in reference to standard time, and presented a very feasible plan for fixing the watch faces for keeping both Greenwich and meridian time.

The President in a few remarks stated that there had been a bill presented before the last Congress for making the use of the metric system compulsory in the government departments after the year 1889.

Professor J. E. Hilgard in a letter which was read stated that four of the five members of the Committee for the International Conference on zero of longitude, etc., to be held in Washington next October had been appointed, and that he understood that the fifth member was to represent the American Society of Civil Engineers.

The following new members were elected: Louis Queen, C. E., Elizabeth, New Jersey; Thomas J. Hyde, Sharon, Pennsylvania; and M. J. Leyland Feilden, of Rappynden, Burwash, Sussex, England, was constituted a life member.

After some discussion the meeting adjourned for two weeks.

AUGUST 27, 1884.

At the meeting the members elected were: Life member, Archdeacon Stock, Wellington, New Zealand; members, Mrs. M. E. Locke, Hamilton, Canada; T. Bahan, Shaws, Pennsylvania; J. Richardson, Cochranton, Pennsylvania; M. Hollaran, Carlton, Pennsylvania; P. McMahon, Utica, Pennsylvania; M. Vining, Sugar Creek, Pennsylvania; David Isanburgh, Franklin, Pennsylvania; William Hennessy, Reno, Pennsylvania; Dr. H. R. Heard, Cleveland.

A letter was then read from Professor W. Rogers, of Cambridge, with reference to the metallic bars which he is preparing for the society.

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Mr. J. N. Wing wrote respecting the open letter recently sent the President of the United States, requesting that the International Institute may be represented at the approaching International Conference at Washington.

Encouraging letters, enclosing donations to the society, were read from Professor Piazz Smyth and Lewis Biden, Port Sea, England. The recent appeal for aid has received a liberal response and prospects are very encouraging.

A discussion upon the relation of the pyramid measures to Bible chronology then took place, the principal speakers being Drs. Redfield and Newcomer, Messrs. A. M. and W. H. Searles and Mr. Latimer.

In consequence of the length of the discussion the reading of extracts from Lieutenant Totten's work on metrology was again postponed, but a resolution was passed that it should be made the order of the evening at the next meeting.

Meeting then adjourned for two weeks.

EDITORIAL NOTES.

Mr. J. M. Goodwin will accept our hearty thanks for his kind and encouraging words touching the work and prospects of the INTERNATIONAL STANDARD.

In our next issue we will present and compare the systems of tables proposed by Prof. C. Piazzi Smyth, Jacob M. Clark, Lieut. C. A. L. Totten and John H. Felton.

In our last issue the letters on Pyramidal Free Masonry, by mistake, attribute to Mr. Wood the theory that the displacements in the Pyramid were caused by heat and warping. It was Mr. S. Beswick who presented this theory.

We have received a letter from Thos. Holland, London, acknowledging, in admirable tone, some criticism made on his problem of the practical construction of the Pyramid. The square and compass are excellent pioneers in Pyramid study, and we hope to have more of Mr. Holland's investigations, even though they may be subjected to the test of mathematical accuracy.

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We are glad to present in this number of the Magazine the portrait of one of the most distinguished, though not widely known, workers in the Great Pyramid subject—Robert Menzies. There seems to have been an inspiration in this man's mind which led him to announce that the grand gallery represented the Christian dispensation, for his discovery, which has been accepted by Pyramid students everywhere, has been fraught with most important consequences, and the influence of it has scarcely yet begun to be felt. He was a young ship architect of Leeds.

The Rev. James French has sent us from the Philadelphia *Inquirer* of July 23, notice of a Bill introduced at the last session of Congress to enforce the use of the French metre with the following provisions:

"Beginning on March 4, 1889, the metric system shall be exclusively employed in all Government transactions. In order to secure this employment a knowledge of this system shall be taught in all schools and colleges under the control of the government or hereafter aided by it, or such knowledge shall be required for admission to those institutions.' There is a proviso to the effect that in all other transactions than those in which the United States is a party it shall be lawful to employ the weights and measures now in use. This bill was read twice on June 30 and referred to the Committee on Coinage, Weights and Measures."

A correspondence has been submitted to us between Emile Low, C. E., of Pittsburgh, and Mr. Theo. Gribi, of Elgin, Ill., in which the former declares himself an earnest advocate of the metric system, "not on account of its being *French*, but a decimal system." He states that the Waltham Watch Company has used the metric system for eight years, and quotes them as saying that "the advantages of its general adoption are so palpable that it would be useless to state them, as anybody at all acquainted with the subject would know"; and

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adds, "These are my sentiments exactly." To which Mr. Gribi, of the Elgin National Watch Company, replies: "We have never used any other system than the English—the inch decimally divided—and we do not find the least inconvenience, nor feel the slightest practical disadvantage. If the advantages of the general adoption of the French metric system are so palpable, it must be very easy to state them, which would be wiser and carry more force than to discredit the intelligence and honesty of the reader who may happen to disagree with the writer, by saying, 'it would be *useless* to state them.'" Mr. Gribi further says, "I am, myself, practically acquainted with the metric system, having been born and educated in a country (Switzerland) where it is enforced, and having used it all my life until within the last six years; yet I find reasons, and good ones, for regretting its introduction. Our legislators may commit the folly of passing a law making it legal, but they can never compel its adoption, and if they should try to do so, it will cause incalculable mischief and wrong."

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD FROM JUNE 9TH TO AUGUST 31ST.

JUNE—Martin Coryell, $5; F. G. Darlington, $5; Thos. B. Lee, $2; John W. Durkee, $2; Prof. C. Piazzi Smyth, $1.22; John N. Poage, $10; John B. Kellogg, $2; E. Coombs, $2; Mr. Burbage, $2; Seth Dean, $2; F. A. R. Winter, $3; Miss Augusta Barr, $2—Total from June 9th, $38.22.

JULY—H. G. Morse, $2; John MacLeod, $5; C. T. Heisel, Magazine, .80; H. W. Bigelow, $2; Hon. Peter Watson, $2; Dr. J. D. Buck, $2; Dr. John Wiggins, $2; F. W. Newman, $2; Dr. C. MacManus, $2; Alex. Hudunt, $2; Capt. J. S. Richards, $2; T. H. B. Beal, $2; F. Hess, $10; S. H. Randall, $2; Chas. A. Wood, $2; J. Ralston Skinner, $5; Dep't Interior, Educational, $2; Col. J. F. Hammond, $2; James A. Collins, $2; Wm. Archer, $2; Wm. McAllister, .40; E. W. Fell, $2; C. N. Dubs $2—Total for July, $57.20.

AUGUST—Thos. R. Reeves, $20; James G. Johnson, $10; Louis Quien, $2; J. H. Devereux, $25; Thos. J. Hyde, $2; C. L. Redfield, $2: Jesse H. Jones, $2; Wm. Chisholm, $50; Clark Fisher, $20; E. Collopy, $12; P. Collopy, $10; Geo. M. Tuttle, $2; J. Leyland Feilden, $24.35; John H. Walsh, $10; Arthur S. C. Wurtele, $2; Charles Kellogg, $10; C. S. Maurice, $10; Sandford Fleming, $10; James McIntyre, $10; L. F. Haskell, $1; Frederiek G. Roeder, $2; Rev. H. G. Wood, $5; Mrs. Angie Damon,

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$10; Miss Emily Damon, $10.85; John Forrest, M. D., $2; Geo. Kellogg, $10; F. R. Kimball, $5; G. M. Atwater, $10; Thomas Bahan, $5; James Richardson, $2; M. Hollaran, $2; P. McMahan, $2; Michael Wing, $2; D. Isanburg, $2; Wm. Hennessey, $2; Michael Kating, $10; P. Bowen, $10; Lewis Biden, $9.74; Prof. C, Piazzi Smyth, $24.35; Dr. H. R. Heard, $2; J. Wylie Smith, $2—Total receipts, August, $364.29.

REVIEWS.

We have received the masterly work of Lieut. C. A. L. Totten, 'An Important Question,' and we heartily commend it to our readers.

It was written to be read before the members, at the meetings of the International Institute, but on account of the extent of the work, Lieut. Totten decided to publish it in its present form.

His system of metrology is cosmical; to call it ingenious would be a tame meed of praise. It is the development of a genius. In one point we disagree with him, viz., in the rejection of the 360° circle and the substitution of the 240°. Many of us feel assured of the relation of the 360° circle to the Pyramid.

We, however, ask a most candid examination of this work, and think it the duty of all members who are able to buy the book to do so, and aid so noble and disinterested a worker. He has no hope of pecuniary gain; he works only for the cause of truth, and will devote the proceeds to the advancement of our whole work.

Referring to an utterance of Garfield regarding the standard of weights and measures, "By laws higher than human legislation, length, depth and height were created; men can only name and declare a definite length as a standard," Lieut. Totten says: "We believe that our ascestors have bequeathed to us a system based upon these higher laws. By the attrition of full four thousand years, our Anglo-Saxon system has lost so little of its ancient truth, that we believe its present possessors —direct descendants of a mighty race—may return to the ancient perfect standards without any inconvenience, and with-

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out altering a single name familiar to our children and to history."

Respecting the inch, he says: "Without reference, therefore, to the absolute length of the unit inch, save that it shall be, when determined accurately, one 500-millionth of the polar axis (and until so determined shall be held at its present statute value), we may agree beforehand that the rectified long measure shall be as heretofore, and as follows." He then gives a table of rectified long measure.

The cuts of the obverse and reverse of the U. S. seal are made by Lieut. Totten upon the advanced and perfect rule of Heraldic art. The cut of the reverse—a pyramid unfinished—is beautiful, and in Mr. Totten's opinion it should be so cut for government use.

We will have a more extended notice and examination of this work in our next issue, but, meanwhile, recommend our members to read the book.

NEW MEASURES OF THE GREAT PYRAMID. BY A NEW MEASURER. Described and Tested by C. Piazzi Smyth, Extended and Corrected from the Review in the *Banner of Israel* for November and December, 1883.

The dedication is as follows:

"To the International Institute, Cleveland and Boston, U. S. A., for preserving and perfecting hereditary weights and measures, more especially the Anglo-Saxon, and for the discussion and dissemination of the wisdom contained in the Great Pyramid of Jeezeh in, but not of, Egypt, this little book, descriptive of some new information on the grand subject which the members have so much at heart, is dedicated by one who has worked at this Pyramid question for close upon twenty years (or ever since the death of the late John Taylor, who commenced it on its present lines), and with continually increasing belief that there is more than accident, more than man's intent, in both its primeval origination and now latter-day intellectual development, is dedicated most respectfully, by their devoted fellow-laborer, C. Piazzi Smyth, Astronomer Royal for Scotland, and for this cause, Ex. F. R. S., London."

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At a meeting of the Society, July 16th, a resolution of thanks was passed to Prof. C. Piazzi Smyth for the honor he had conferred upon the International Institute by dedicating to it this valuable contribution to Pyramid literature. As the review from the *Banner of Israel* has already appeared in our Magazine, we will not give here an extended notice of this work, but recommend it to our readers as an epitome of the latest information on the subject of the Great Pyramid. It is printed and published by Robert Banks, Racquet Court, Fleet street, London, England.

NOTES AND QUERIES.

APOCRYPHA AND APOCALYPSE. What is the true meaning of these words?

A SEEKER.

The word Apocrypha is from the Greek *apokryphus*, and means *hidden*, *spurious*. In Matthew's translation of the Bible, published in 1537, the dutero-canonical books were separated from the others, and prefaced with the words "The volume of the books called Hagiographa." In Cranmer's Bible published in 1539, the same words were continued; but in the edition of 1549, the word Hagiographa was changed to Apocrypha which passed through the succeeding editions and into King James' version. These apocryphal books are received as canonical by the Roman Catholic church, and are intermixed with the Old Testament books in the Douay version. The Protestants reject them as being canonical, but receive them as historical. Hence the term as now generally used is in the sense of uninspired.

The word Apocalypse is from the Greek "apokalypsis," and means "to uncover," "to reveal." It is the Greek name of the last book of the New Testament, translated Revelation. From the many interpretations put upon this book it would seem to be a misnomer, and the hidden sense of apocrypha to be more in accordance with its estoric meaning.

ENOCH THE SECOND MESSENGER OF GOD. I am led to inquire further in reference to this recent edition or version of the Book of Enoch by Dr. Kenealy, and why called the Second Messenger of God? I never heard of only Richard Laurence's translation of the Book of Enoch.

E. M. J.

In answer to this correspondent we will take the facts as they appear in the works of Dr. Kenealy, six thick octavo volumes having been published prior to the author's death which occurred about four years after publishing the Book of Fo. This eloquent author's volumes are ample proof of the onward progress of the human race. He asserts the Apocalypse to be far older than christianity, and to have come down from the most remote antiquity, being the revelation of the whole drama of human history. With almost infinite learning and patience, he has endeavored to show that the Apocalypse was originally revealed to a primeval John, otherwise called Oannes, and identical with the First Messenger of God to man. His theory is sufficiently remarkable to be given here. The Messengers of God are twelve in number, and are claimed to have appeared at intervals of 600 years as follows:

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1. Oannes (Adam), A. M., 3,000; 2. Enoch, A. M.. 3,600; 3. Fo-hi (Budda), A. M., 4,200; 4. Brigoo (Brahma), A. M., 4,800; 5. Zaratusht (Zoroaster), A. M., 5,400; 6. Thoth (Hermes), A. M., 6,000; 7. Amosis (Moses), A. M., 6,600; 8. Loa-Tseu (Confucius), A. M., 7,200; 9. Jesus (Christ), A. M., 7,800; 10. Mo'-Ahmed (Mo-hammed), A. M., 8,400; 11. Chengiz-Khan (King of Kings), A. M., 9,000; The 12th Messenger yet to be revealed, A. M., 9,600.

With the aid of this theory the whole history of the world down to the present time is shown to be foretold in the Apocalypse, and although it may be difficult for many to agree with this accomplished author's conclusions, supported by him with an array of learning, and a sincere belief in what is stated, no one with any taste for these studies should be without this illustrated wonderful series of books. Throughout the many thousand pages of closely printed matter, the writer manifests a sincere reverence for true religion, and seeks only to expose the errors which priests and interested persons have promulgated from time immemorial. The author remains strictly anonymous throughout his entire series. The title-pages of his volumes are printed in colors, and all bear the symbolic name, "by ⊙," (the central spot being black), followed by quotations. Their titles are as follows:

The Book of God. The Apocalypse of Adam-Oannes, by ⊙. "I will teach you by the hand of God; that which is with the ALMIGHTY ONES will I not conceal."—Job xxvii, 11—pp. 647.

The Book of God. An Introduction to the Apocalypse, by ⊙. "Unto you, O Men, I call: and my voice is to the sons of Adam."—Proverbs viii, 4—pp. 752.

The Book of God. A Commentary on the Apocalypse, by ⊙. "I will declare dark sayings of old."—Psalms lxxviii, 2—pp. 853.

The Book of God. Enoch the Second Messenger of God, by . Vol. I, Frontispiece—Circle of Inchoation. *Alpha* and *Omega*—pp. 368. Vol. II, Frontispiece—Cwenila. *Alpha* and *Omega*—pp. 339.

The Book of God. Fo the Third Messenger of God, by ⊙. Introduction illustrated with Budda—pp. 333.

When this volume was through the press the author's death was announced which closed the elaborate plan of the author. The next two volumes which were in preparation were, 'The Book of Lao-Tseu, the Fourth Messenger of God," and "The Book of Zaratusht—The True Zend-a-Vesta—the Fifth Messenger of God."

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ERRATA.

PAMPHLET.

Report on Standard Time, also same report appended to INTERNATIONAL STANDARD July, 1884.

Page 15—5th line from bottom, for "unexplored" *read* explored.

Page 16—5th line from top, for "exploration" *read* exploitation; 3d line from bottom, for "nearly attainable" *read* nearly perfect attainable.

Page 19—33d line from top, for "the geography" *read* geography.

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THE

INTERNATIONAL STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

NOVEMBER, 1884.

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The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

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CHARLES CASEY,

Born in city of Dublin, Ireland, 1822, hypothetical discoverer of the mysterious Messianic date line 2,170. Deduced from Robert Menzies' thesis, and demonstrated by the laboriously accurate test measures of C. Piazzi Smyth.—See 'Our Inheritance in the Great Pyramid,' pp. 465-470.

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THE INTERNATIONAL STANDARD

NOVEMBER 1884.

PRESIDENT BARNARD'S ATTACK ON THE GREAT PYRAMID METROLOGY.

COMMENTED ON BY C. PIAZZI SMYTH, ASTRONOMER ROYAL FOR SCOTLAND, AND AUTHOR OF "OUR INHERITANCE IN THE GREAT PYRAMID," "LIFE AND WORK AT THE GREAT PYRAMID," AND "NEW MEASURES OF THE GREAT PYRAMID, TESTED."

After a long interval, during which any mere accidental errors in the earlier portions might well have been corrected, the third part of the Very Reverend President Barnard's discourse on the Great Pyramid Metrology, in the Columbia College's "School of Mines' Quarterly Journal," has reached me. And as I have now read it carefully, equally with its predecessors, the time seems to have arrived for saying something of how I find it.

Its first portion, you may remember, appeared in January, the second in March, and now the third in May, 1884; and the three mount up altogether to nearly a hundred pages. It might naturally, therefore, have been expected that so bulky an article,—coming from one of the mature age and dignified standing of President Barnard, of scholastic reputation in past years as a physical mathematician, and, if I am informed aright,

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a fully ordained clergyman of rather pronounced High Church proclivities, as well as the chosen ruler and chief example to the students of Columbia College,—would prove to be a very important contribution to latter-day Great Pyramid literature.

Such, however, is unhappily far from being the case. For, just as always happens with any smaller men venturing to ridicule a subject before they understand it, and then falling into grievous errors, so even the very learned and Reverend President Barnard having, with but little knowledge of the Great Pyramid's metrological theory, undertaken to abuse and denounce it for a purpose, he makes so many mistakes or misstatements, and some of them of the first magnitude, that there is little or no force in his essay after all for those who have already studied the subject. He simply shows us the saddening spectacle of an old man blindly caring very little for either what words he uses or what sentiments he expresses, only so that the Great Pyramid metrology shall be very effectually stamped out of all recognition, and nothing connected with it be ever again allowed to form a serious obstacle to the American people, at his advice and suasion, giving up their hereditary Anglo-Saxon metrology, and enslaving—emasculating, a recent writer calls it—themselves in deference to the utterly foreign and most unsuitable French metrical system.

If the attack had only been plain and straightforward it might well have been left to sink or float on the stream of public opinion, as its merits or uses might deserve. But there are so many most tortuous accounts of important matters of fact; and wherein, too, I have the distinction of being professedly quoted and held up to scorn as the peccant authority—that some, at least, of these cases should be unravelled, if only to warn ingenuous readers that for anything crucial I may have written on the Great Pyramid subject, especially as touching its most advanced and latest published features—they should refer to my own words, and never trust Professor Barnard's versions of them.

Even as to date, so all important in a subject gradually unfolded during the last very few years and still unfolding, the President quotes only from the second edition of my 'Inheritance in the Great Pyramid,' actually calling it, however, in

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1884, "the new and enlarged edition," though it was published to his own knowledge so far back as 1874, while the third edition, almost re-written and much extended, had appeared in 1877; and the fourth, still more increased and improved, in 1880.

But far more deeply disappointing was it to me to find the Reverend President taking up the scoffing sneer of a vulgar and I fear infidel author, and calling my whole scientific research into the facts and history of the Great Pyramid, on the lines opened up by the late John Taylor, "the Pyramid religion" (p. 108); "the Pyramid faith" (p. 108); "dogmas of the Pyramid religion" (p. 300); and speaking of some other plain-working and God-fearing men in science as "the Pyramid religionists" (p. 107); "preachers of the Pyramid faith;" "devotees of the Pyramid faith" (p. 309); and "the apostles of the ancient Pyramid faith" (p. 329); while he pretends to be very restive and indignant at "the doctrine preached to us by the disciples of the Pyramid faith" (p. 212). In fact the continued misuse for a contemptuous purpose, through all three papers, of words considered sacred among all Christians, makes one wonder distressfully at last what sort of ideas of religion itself President Barnard can possibly have. Not very Biblical it would seem, for on his opening page he assumes the history of Adamic man upon earth as wholly an affair of his own voluntary, spontaneous, unaided effort, whereby he raised himself from the lowest stage of savagedom into civilized life and high mental attributes, or in total contradiction to what the Bible says of it. And with similar want of agreement with revelation, on his fifth and sixth pages, the president alludes to the duration of Noah's life after the deluge as though it had been a span of a few days only, while the Biblical chronologies make it extend to any period between three hundred and fifty and twelve hundred years.

Hence to tell such a one that he is profaning the name, objects and character of "religion" to apply it sneeringly to a subject with him of scientific enquiry only, and which has never been brought forward as a "religion" by those who have studied it; has never been hinted at by them as a method of salva-

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tion; never spoken of as a mode of approaching God for the forgiveness of personal sins, nor intended in the slightest degree to alter or supplant a single item in the Gospel of our Lord and Saviour Jesus Christ, though it may, and has most unexpectedly brought to light, remarkable corroborations of some of the primeval divine inspirations in earthly wisdom from God to man. Inspiration in this case afforded apparently to one of the earliest Hebrew prophets a grand existency in those times, and once temporarily in Egypt, but antagonistically to the Egyptian idolatry there. To speak, however, I repeat, of the real characteristics of true religion to such a one as the president shows himself to be throughout his three discourses, is to speak to a merely dry schoolman who, in spite of any amount of such learning, remains and ever will remain entirely unappreciative of the very fundamentals of our blessed Christianity.

Contenting myself, therefore, with a simple protest against President Barnard's continued profanations of the word "religion" and whatever is connected with it, I proceed to examine, at rather greater length, some of his misrepresentations of those scientific numbers and facts on which the inspired, long-concealed and anti-Egyptian principles of Great Pyramid metrology rest, for some of its most unexceptionable proofs.

These numbers and facts having been largely obtained from the ancient monument, and first published in numerical form by myself, it seems a settled object with the president to invalidate me as a measurer, reject my measures, and then present the Great Pyramid metrology to his readers, without any of my doings mixed up with it. That, too, is perhaps allowable and understandable enough as a method of war; though I must even then regret that careful mensurations of important parts of the monument, not yet measured by any one else, are not to be allowed to appear any more before the world, because forsooth President Barnard has chosen to object to the person who made them, for reasons of his own invention.

Yet why, after that, does the president next run the same person down with equal or even greater vehemence, for *not* having made measures of certain other parts of the Great Pyra-

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mid? Such illogical inconsistency is almost incredible; yet, towards the end of his first paper, the president occupies no less than three pages with bitterest invectives against me for not having, with my own hands, measured the base-side length of the Great Pyramid in 1865. He paints an ideal picture of my having had unlimited time, money, instruments, men and whatever was necessary for making that measure; and thereby, according to his previous harangue, of inevitably vitiating the stream of Pyramid knowledge at its fountain head. And yet I did not do that mischievous thing. But now, precisely because I did not, he accuses me again and again of being absolutely "unpardonable," and even infers that there must be something particularly black about the omission.

Seeing, however, that I went out to the Great Pyramid on my own private idea alone, at my own private expense, on a limited leave of absence from my duties at home, and with no more funds than the little I could squeeze out of my miserable salary of £300 *per annum*, it was rather a wonder that I could go out at all and do anything in that expensive region. But at least I was my own master to choose what I would do myself, and what I would leave to others in a work far too large for me to contemplate undertaking the whole.

Now, in making this choice, I was largely guided by what other explorers and measurers were taking up at that particular time. Wherefore, if the president, waxing still more condemnatory of my having omitted to make that base-side length measure myself, seeks to justify his condemnation by adducing this further fact that, in his own words, "two engineers, Aiten and Inglis came to Gizeh when I was there to make that very measurement," and did make it "with a thoroughness of which there had been no former example"—that was exactly why I kept on working at the other subjects I was engaged on, and did labor at, every moment of my time, until the day of my forced departure. For is not division of subject as well as labor, a recognized method everywhere for enabling a few workers to gather in an extensive harvest? Or, if I am to be of no authority upon the Great Pyramid because my own measures there, though numerous enough according to the

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president, to fill a volume, did not include one of the base-side length, of what standing is President Barnard, who has never measured anything whatever of the mighty monument, and has not even seen it?

The president, however, is not quite right in saying that Messrs. Aiten and Inglis measured the Great Pyramid's base-side length under my very eyes, for they came rather when I was leaving, made their chief measurements after I was gone, and communicated the results to me only after we were all returned to Scotland. More decidedly, too, is the president wrong in insinuating (p. 117) that I called them "blundering engineers," and declared their measurements to be "to my disgust." Those are *his* choice phrases, and I leave them to him to explain whenever Messrs. Aiten and Inglis may call him to account.

For myself—although more accurate measurings have been taken since then by several parties—I consider Messrs. Aiten and Inglis' result a most important step, very happily made at the time it was, towards the discovery of the truth touching the Great Pyramid's base-side length as intended by its ancient architect. Previous to their visit, the only *socket-defined* measures had given (in British inches) 9164 and 9168, or something like these numbers; and nothing less than 9160 with some few units appended, could be admitted. But when Messrs Aiten and Inglis announced their mean result to be 9110, and the Royal Engineers gave out 9130 a few years afterward—it was evident that with due scientific regard to all the measures taken on the ground, and the principles of discussing such observations afterwards—no result so high as 9160 could be entertained; nor, again, any so low as 9110, but that the truth should lie somewhere between; and I came, moreover, early to the conclusion of 9140 being the true quantity to the nearest whole inch. Yet on this point also is poured forth once more the wrath of the president, who, overlooking that before I theorized on them I had printed Messrs. Aiten and Inglis' simple numerical results so faithfully and fully that those able engineers were content with that publication; and overlooking also that it is the universal practice of all scientific men, when taking

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means of discordant measures of one and the same quantity in Nature, to assign weights to the different results if they know of any causes which should make one more, or less likely to be truthful than another—the president, I say, inveighs against me for having arrived at that number, 9140—when it was neither the simple arithmetical mean of all the quantities taken as of equal weight, nor was it any one of the quantities taken by itself alone, as absolutely exact and without the smallest reference to the others.

To all which taunts I can answer most conscientiously, "Of course not!" And though the president comes out soon after with a further evil insinuation, that the 9140 was brought out "because it was wanted," but that it ought to have been 9140·176045, a futilely, hair-splitting expression worked out by himself, and of which only the first decimal place is likely to hold for more than a few years. I must now leave this over-long subject of the base-side length of the Great Pyramid, for it will come up again in another place; and meanwhile we have the president's diatribes on both my measures made, and theoretical explanations published, for the size of the coffer, inside of the Great Pyramid,—to notice.

This coffer subject is taken up chiefly towards the end of the second, and beginning of the third, part of the president's essay.

That very little reliance, in his opinion can be placed on my measures there, the president (p. 294) implies, not from any new discoveries of his, but merely from my own numbers, purposely published by me long ago, to exhibit the discrepancies of different methods, but yet the convergence of certain commensurabilities; as thus, for the capacity of the coffer:

From direct interior measures,	71.317	cubic	Pyramid	inches.
From exterior measures, halved	71.160	"	"	"
From seem of bottom and sides,	71.266	"	"	"

He allows, however (p. 213), that "the contents, by different methods, vary from a little above to a little below 71.250 cubic inches," but makes it his chief contention that my theoretical explanation of that quantity is obtained by using false numbers. I had looked on it as the tenth part of the cube of the ten-

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millionth of the length of the earth's polar axis in inches, multiplied by the mean density of the earth expressed in terms of water. And that the president allows is not wrong in itself, but only in the flagrancy of my having taken (as he is bold enough to aver) a value of the axis of the earth divided by ten millions (viz., 50.05 British inches) "which no computer has ever found," and a number expressive of the earth's density (5.7) "which no investigator has ever reached."

Yet what investigators have reached in this latter subject, even as given by the president in another paragraph, has varied from Cavendish's 5.32 in the last century, to Airy's 6.56, in the present! But considering the late Mr. Baily's quantity of fifty years ago more probable, and calling it 5.66 instead of the 5.675 at which Baily announced it, President Barnard finds my Pyramid-derived quantity of 5.70 too large by 0.04. Why, however, when he is writing for the youth of his country, in 1884, does he not quote the latest and best authority in all physical science, viz., Mr. Joule, in the Royal Society Proceedings for 1878, bringing out from new experiments of a grand order, the number 5.69, or only 0.01 less than my Pyramid quantity. And seeing that so eminent a scientist as Sir G. B. Airy had previously brought out a number 0.86 larger, the Pyramid result of 5.70 cannot be said with any truth to be too large beyond all precedent.

But touching the earlier element in the coffer calculation, viz.: the ten-millionth of the length of the polar axis of the earth, in British inches, it is quite true that I had used that quantity as being 50.05 long, whereas the president of Columbia College now pronounces it to be only 49.273 of the same units in length; and then, cubing that terribly smaller number instead of the larger one, and multiplying the result also by his small version of Baily's earth density, in place of the Pyramid quantity, he brings out for the final theoretical contents of the coffer, on my lines of explanation as he tells his readers, only the miserable 67.865, in place of 71.464 British, =71.250 Pyramid, cubic inches.

No wonder, therefore, that he denounces this 67.865 number,

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in its littleness, as "a disgraceful break-down of the *rationale* of Professor Smyth's process!"

But is the president, in arriving at it, any more correct in his 49.273 number for the ten-millionth of the earth's axis of rotation than he was with his 5.66 for the earth's mean density? For authority he refers to his own previous statement in another part of his paper, giving the last five, and supposed best, computations in the whole world of the length of the earth's rotation axis, derived from arc of the meridian measures, and then he quietly takes 49.273 as the ten-millionth part of the mean of them all.

But, on referring ourselves for the full, original numbers to his page 122, we find given there, for the length of the earth's polar axis:

By one authority = 500, 489, 604 British inches.
By another authority = 500, 504, 818.9 British inches.
By another authority = 500, 491, 440 British inches.
By another authority = 500, 487, 768 British inches.
By another authority = 500, 490, 432 British inches.
And by another in a note = 500, 532, 230.4 British inches.
By another in a note = 500, 550, 410.4 British inches.
By another in a note = 500, 369, 956.8 British inches.

And how, out of all or any of these quantities actually given by himself, the learned president of Columbia College can get 49.273 as the ten-millionth part, must be a matter of astonishment to the world and of grief to his friends. For, whether it be by a blunder or a perversion, the error is huge enough to throw modern science, as represented by President Barnard, back through the ages two hundred years at least, while it leaves my Pyramid quantity of 50.05 absolutely untouched and irrefragable so far as it goes.

Another class of misstatements and asserted detection of error in the Great Pyramid theory as held by others as well as myself, is illustrated by what the president writes of temperature. He begins by erroneously assuming that they all allude, in their standard quantity, to the mean temperature of the entire surface of the earth, on which hypothesis of his own he concludes their 68° Fah. to be much too high. Yet they had particularly confined themselves to permanently man-inhabited

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latitudes, signally excluding therefrom the circumpolar portion of either hemisphere; wherein (see Job xxxviii, 22-23) God has laid up his stores of cold, and which, though man desires to break into, he has never yet succeeded in reaching. For though he has been for centuries sending thither expedition after expedition of ships, men and money, each of them has failed, stopped half way, and on its return—even down to the barely recovered survivors of the last party just snatched from the jaws of a miserable death, in the present year—it brings back more and more appalling accounts of hardships, obstacles and impossibility to man.

And again, while the president chooses to contend that the region of lower Egypt, having a higher mean temperature than 68°, prevents the Great Pyramid representing that quantity, the Pyramid students have always been particular in pointing out that the Great Pyramid does not stand in the low country of lower Egypt, but on the table-land of the desert to the west of it, where the temperature is sensibly less, while the critical quantity of 68° is considered even there not to apply to the level of the ground, but to the elevation of the king's chamber above it.

But if there is any one part more than another of the Great Pyramid theory which all its students and illustrators have been agreed on for many years past, it is, that the mind which directed its architecture to embody certain deeply significant numbers, weights and measures expressive of the earth's cosmical relations, was Palestinian and Hebraic, not Egyptian; and its purpose not for contemporary instruction to any one, and least of all, to the rebellious idolatry of Egypt, but to serve the future plans of God, and to come out as a most unexpected sign and witness to him (see Isaiah xlx, 19-20) during the latter, *i. e.*, these present, days of the earth. So that, for the success of its high intentions, the hidden nature of the one Great Pyramid in, but not of or pertaining to, Egypt, was necessarily concealed from the people of that land. Yet, says the imperturbable President Barnard, when there is not found upon any Egyptian building a single inscription to tell the Egyptians that the Great Pyramid was erected for such a purpose, how can we believe? it

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This ejaculation of the president's may be left to answer itself in the present age, and in the homes of every Anglo-Saxon Christian community, where each earnest enquirer has something much better to guide him as to the history of the God of Israel's dealings with his chosen people, and his preparations for the Christian era "from the beginning of the world," than any inscription ordered to be painted upon the buildings of their own days by the Pharoahs of old Egypt—the authors of those colossal idols which God declared should bow down, and they have done so.

Nor are the very curious details of modern practical science, in its newest laboratories, any safer guides to those who would reverentially seek to become acquainted with the ancient messages of inspiration from God to man. So that when President Barnard describes all the little tools and nice materials, the glass plates, microscopes and delicate balances of a modern weight-and-measure making workshop, and finding nothing of them but only the gigantic coffer vessel in the king's chamber of the Great Pyramid, declares that that cannot have been intended to be a vessel of accurate capacity measure, or to illustrate any high principle connected therewith, we feel inclined to ask him how much he finds about priests' vestments, wax candles, altar cloths, painted windows and the thousand-and-one of ecclesiastical adornments which High Church clergymen of his class deem so very important, in the New Testament? And yet that inexpressibly Holy Book contains all that is necessary to the salvation of man, and has altered the face of the world in establishing the Christian religion thereon.

But worse follows when the president employs the magnificent powers of the learned mind with which he has undoubtedly been gifted, to raise up mystifications of dates out of profane story to confound the chief dates of sacred history. Or when he resuscitates undoubted idolatrous and artistical architecture, as that of the Temple of Ephesus, to compete with the purity of, and New Testament allusions to, the Great Pyramid's peculiar points of symbolization and construction. But so self-satisfied is he with his own performance that—deeming he has now entirely suffocated the Great Pyramid theory under his

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heaps of sarcasm, ridicule and misstatement—he actually suggests, with sneering charity, that the poor Pyramid students should henceforth take up and work out the heathenish views which he has just suggested to them.

The said students of the Pyramid, however, so far as I know anything of them, would much rather that President Barnard should work out his own theories, and be left to stand before a higher tribunal than man's. While it might be wise in him to allow conscience and public opinion to speak and answer the question: Is it becoming in one who professes to be a teacher of the Gospel of Christ to deride those who own no other Master than the Lord Jesus Christ, and to put heathen gods and goddesses as teachers and examples before men?

In what lowest deeps, however, are there not deeper pits still. For the third section of the president's attack concludes with a notice of Mr. Flinders Petrie's book, out of which he picks that particular part of the base-side length discussion touching the Great Pyramid, which is computed on the assumed level of the pavement piece near the middle of the side, and makes it, at that elevation, only 9068.8 inches. This quantity the president presents as the only result, so that, positively concealing everything else which both that author and all other Pyramid measurers for a long time past have had to say with regard to the original and Scripture-justified base-side length depending on the sockets cut into the rock at a lower level, and reaching there in one case to more than 9139 inches in length, the "Very Reverend" President expresses himself thus:

"The form of the base is sensibly square. The side of this square has been hitherto the unknown quantity in the Pyramid religion, but it has been a fundamental article in the creed that it should measure just 9,140 British inches. By the inexorable laws of trigonometrical science it is proved to measure, in fact, only 9068.8 British inches. With this determination the beautiful union of the sacred cubit and the length of the tropical year melts away into the air, to be heard of no more among men."

Than such a sentence as this, wilful perversion, misstatement

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and concealment of facts, can no further go. Happy for us that it is found, not in the papers of any of the members of the International Institute for Preserving and Perfecting Anglo-Saxon Weights and Measures, but in those of a would-be enslaver of his countrymen to the atheistically introduced French metrical system. An aged man, whose gray hairs might well have led to better things, but like most aged men so prone to live in memory of the past that he evidently is not yet awaked to the newly discovered glorious destinies of the Anglo-Saxon race, the coming "Heir of the World," under the divine promise of old, and with no longer therefore any need—as in times of ignorance, poverty and scanty numbers now happily passed through—to Frenchify itself in order to rise to the greatest heights and privileges of civilized man, in allegiance to Almighty God alone.

C. PIAZZI SMYTH.

P. S.—The foregoing paper was written by me several weeks ago, when in the country; but having now returned home and looked over the INTERNATIONAL STANDARDS, Cleveland *Plain Dealers*, letters and books accumulated by post during my absence, I find therein much that is both confirmatory of, and supplementary to, the general views arrived at. Thus:

(1) Mr. Astronomer Baxendell, of the Observatory, Southport, in England, shows in the important matter of the Pyramid's *versus* Modern Science's, sun-distance, that President Barnard both misquotes and misrepresents the numerical quantities already introduced into his pages, over and above leaving out others which ought to have been mentioned, with the effect of making white in so far appear black, and black white.

(2) The admirable papers of Rev. H. G. Wood, Sharon, Pa.; of Mr. C. Latimer, Mr. Dow, Mr. Beswick and other good writers on the *socket-defined* base-side lengths of the Great Pyramid in addition to and extension of the *pavement-surface* base-side length, make the total exclusion of the former from all mention by President Barnard more extraordinary than ever.

(3) A truly grand paper in mathematical physics by the learned Professor Pliny E. Chase, of Haverford College, Philadelphia, shows that the earth is the harmonic centre of condens-

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ation for the harmonics of the whole solar system reaching even to the stars, by reason of its being the largest of the very dense planets, and from "its orbit traversing the secular centre of the belt of greatest condensation."

The mean density of the earth is therefore an affair not only of terrestrial but of cosmical importance, and is found, in the Great Pyramid metrology, to be worthily and appropriately introduced as the foundation of its system of measures of weight, while in the unfortunate French metrical system it has escaped notice altogether, and nothing but the density of water is referred to there, as though our solid globe of the earth consisted of nothing but water, and its inhabitants were fishes only.

(4) Finally the rapidly opening fortunes of the Anglo-Saxon race, trusting to God and itself, are admirably set forth in Lieutenant C. A. L. Totten's weighty and spirited book on metrology, dedicated to "The English-speaking Peoples of the Earth, who already possess the world's gates of commerce, who raise its food supply, lock up its surplus, and conduct its trade; who own its mines, coin its money, and control its industry; who invent its means of progress, cultivate its intellect, and elevate its religion; who tone its morals, liberate its inhabitants, and stem its tide of errors."

The reason of that remarkable outcome in this latter day is shown week by week in the *Banner of Israel*, (*i. e.*, the descendants of the ten tribes, not the Jews) to be due to the primeval promises of God to Abraham, and the commencement of the long appointed recovery of God's chosen people, who have been so long lost to the world, but who are now entering on the promised blessings, as Christians in heart and soul and missionaries of the Gospel of Christ our Lord.

C. P. S.

EDINBURGH, August 20, 1884.

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THE IDENTITY OF THE ANGLO-SAXONS WITH THE LOST TEN TRIBES OF ISRAEL.

In the illustration of this subject the design will be to show that the perfect fulfillment of the promises made to Abraham, to Isaac and to Jacob is found in the Anglo-Saxon race.

I. What are these promises? See Gen. xii, 1-3.—"Now the Lord had said unto Abram, get thee out of thy country, and from thy kindred and from thy father's house, to a land that I will show thee. And I will make of thee a great nation, and I will bless thee, and make thy name great, . . . and in thee shall all families of the earth be blessed." Gen. xvii, 1-8. —"And the Lord appeared to Abram and said unto him, I am the Almighty God; walk before me and be thou perfect. And I will make my covenant between me and thee and will multiply thee exceedingly. . . . . For a father of many nations have I made thee: and I will make thee exceeding fruitful . . . and kings shall come out of thee. And I will establish my covenant between me and thee and thy seed after thee in their generations, for an everlasting covenant; and I will give unto thee and to thy seed after thee, the land wherein thou art a stranger, all the land of Canaan, for an everlasting possession. And I will be their God." See also Gen. xviii, 18 and xxii, 15-18. To Isaac, Gen. xxvi, 3-4; to Jacob, the same promise, Gen. xxviii, 13-15; and the blessing of Joseph and his two sons, Gen. xlviii, 1-20.

II. The teaching of these promises.

1. The possession of the whole land of Canaan, as a perpetual inheritance, to the lineal descendants of Abraham.

2. An offspring as numerous as the sands of the seas, embracing many nations.

3. All nations of the world to be blessed through Israel.

4. Ephraim to become a multitude of nations, and Manasseh to become a great nation.

Where now shall we look for the fulfillment of these prom-

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ises, not the fulfillment of *one* only, but of *all* of these promises, and that to the very letter? For if we cannot find such a fulfillment, where are we?—the Bible is but a fable, and God's word is proved false.

The history of the children of Israel is known to all readers of the Bible (for such only do we write) down to the exodus from Egypt, and thence through the wilderness to their entrance into the land of Canaan; their settlement in that land, under Joshua; the reign of the judges; the clamorous demand for a king; the anointing of Saul as the first king; the selection of David, the son of Jesse, as the king prefiguring Christ; and the reign of Solomon who builded the temple. Here ends the unity of the nation of Israel. At the death of Solomon his son Rehoboam comes to the throne. And the elders of Israel come to him and counsel with him as to some mode of relieving the nation from the great burden of taxes laid upon them by the building of the temple. But Rehoboam, prefering the counsel of the young men, rejected that of the elders. (See 1 Kings xii, 1-15). The result was the breaking asunder of the nation into two kingdoms, viz.: the kingdom of Judah, of two tribes, and the kingdom of Israel, of ten tribes; and the capital of Judah was Jerusalem; but the capital of Israel was Samaria, B. C. 980.

The history of these two kingdoms is found recorded in the first and second of Kings, and in Chronicles. The kingdom of Israel continued till the Assyrian captivity (B. C. 741) when a portion of the tribes were carried away by Tiglathpileser into Assyria. (See 2 Kings xv, 29, and 1 Chron. v, 6-26; Isa. ix, 1, next B. C. 721). The capital Samaria was besieged by Shalmaneser, and the whole kingdom was torn up and the tribes carried away to Assyria and placed in the cities of the Medes, on the river Gozan. (2 Kings xvii, 6-24, and xviii, 10-11). Here the kingdom of Israel becomes lost. The kingdom of Judah continues until the Babylonish captivity, about B. C. 588. (2 Kings xxiv, 10-16, and xxv, 8).

III. Let us now learn, if we can, what became of these ten tribes of Israel.

If the promise made to the patriarch is true, these tribes—

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this nation of Israel—must still be in existence somewhere in the world, not bearing the name they had while in Canaan, for the prediction by the prophet was that they should "be known by another name, and by another language should they be addressed." Their own identity they should lose, that "they shall abide many days without a king, without a prince, and without a sacrifice." See Hosea iii, 4. It is commonly said that the ten tribes were carried away to Assyria, which, I think, is true, although a part of Dan and the tribe of Simeon seem to have escaped that captivity. Dan and Simeon both had their lots assigned to them on the southwest of Canaan, bordering on the Mediterranean sea. The tribe of Dan found, after a while, their lot becoming too small for them, and therefore a colony was formed, which removed from the old homestead and located at the extreme north of Canaan, near the foot of Lebanon. This colony we will leave for the present, but shall refer to them by and by.

The tribe of Dan, it is said, "abode in ships," and when Solomon was building the temple Dan was employed in merchant service, and went in ships to Tarshish, in Spain, and thence around into England and Wales, for tin (and other things) which was used by Solomon in the sacred vessels of the temple service, B. C. 1005. Hence the country of Spain and of the islands of the sea were not unknown to Dan and Simeon.

Now, it is found that Dan and Simeon were neither of them disturbed by Shalmaneser, because the kingdom of Judah lay between Samaria and Dan; and Judah being at peace with Assyria, these two, Dan and Simeon, were not captured. But they, belonging to the kingdom of Israel, and their king, with all his army and the mass of the population, being carried away, and their capital being utterly destroyed, Dan and Simeon are said to have embarked in their ships and fled away to the islands in the northwest; and at length they landed, Dan on the north coast of Ireland and Simeon in Wales, where he has remained to the present day. Dan located in Ireland, where he at length organized a kingly government, about 700 B. C.

Let us now return to the other branch of Dan, in the north of Canaan. This branch of Dan seems to have been carried

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captive to Assyria and placed on the river Gozan with the other tribes. But he seems not to have rested quietly there; his pioneering spirit soon began to manifest itself, and we find him wandering off north between the Caspian and the Black Seas; and wherever he camped for any length of time, there he left his name—"Dan." Hence the first principal river he crosses, the name Dan (now called Don) is given to it. Next we come to the river *Dan*-ieper, then to the *Dan*-iester, next to the river *Dan*-ube, where a longer encampment was made; thence up the Danube, making temporary settlements only, until they finally landed in *Dan*-emarke (now Denmark). Here they spread out, occupying not only this state, but also Holland and Sweden, etc. At what date this settlement was made it is not definitely known, but it is believed it must have been B. C. at least one hundred years.

JEREMIAH GOES TO IRELAND.

At the time of the Babylonish captivity (see 2 Kin. 24: 10–16, and 25: 28, etc.) it is stated that Jeremiah, who had been imprisoned on account of his faithful preaching against the idolatry of the Jews, was ordered by Nebuchadnezzar to be taken up out of the miry pit, and liberty granted to go whereever he desired, and that his wants should all be met and assistance given him in performing his work. And now as the Jews had been defeated by the Babylonians, and their king Zedekiah taken, his sons slain, his own eyes put out, and all to be carried captive, Jeremiah is said to have gone into the temple, before it had been despoiled, and taken from thence the tablets of the law, Jacob's stone, and such other sacred things as he desired, together with the king's daughters who had been trusted to his care. All these, with Baruch and other attendants, after going down to Egypt, went all together away to Dan, in Ireland; on their way they were obliged to put into port in Spain to repair their vessel; and these two men are reported to have carried out from the ship a stone which was deposited on the ground safely, with other things from the vessel; and after repairs had been made these were all transferred back to the vessel. Thence they proceeded on their voyage, and were driven ashore in a storm on the north coast of Ireland.

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Here Jeremiah found Dan to have organized a sort of kingly government, and the then reigning prince was Eōchaid II. This prince on beholding the princess daughter, of Zedekiah, was enamored with her beauty, and soon proposed an alliance. To this Jeremiah readily consented, but on this condition: that the government should be purged from all "Baalism," and the divine law as recorded on the tablets should become henceforth the constitution of the kingdom. To this requirement Eōchiad readily assented; and soon the marriage was consummated by Jeremiah, and Tephi (for that was the name of the princess) was crowned queen upon the sacred stone Jeremiah had brought with him, and the prophetic benediction given; that her and her offspring this stone should ever accompany; and every succeeding ruler sould be crowned thereon. And it is positively declared, by the tradition of Ireland, that on this stone every ruler in Ireland was indeed crowned. Fergus the First took it over into Scotland, where it was used in the coronation of every ruler down to James the Sixth of Scotland—afterwards James I. of England, and thence to no Victoria, the last that was crowned thereon; and that this very stone is to-day in the coronal chair in Westminster Abbey.

In Ireland these traditions also state: that Tephi died after a few years, leaving a young family of children and Eōchaid to mourn her loss; that to Eōchaid this loss was almost unsupportable, his love to her was so great; that he determined to build a great mausoleum at Tara, where their love had been plighted, and there erect a monument worthy of the memory of that queen, whom all the people adored no less than himself. In this grave, it is believed, were deposited the two tablets of the law, and the Ark that had from the first contained them. For it will be remembered that when the sacred vessels were taken from the temple by the Babylonians, every article was specified by name, but no mention whatever is made of the Ark of the Covenant. And so also, in the order from Cyrus to restore all the things taken by Nebuchadnezzar to the Jews, to be returned to Jerusalem for their temple, no mention is made of the Ark, although all other things were mentioned by name. So also Josephus specifies all the articles brought back

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from Babylon to Jerusalem, but is silent as to the Ark. Now the Ark was known to have been in the temple at all times up to the Babylonish captivity, but the history of the world knows nothing of the locality of that sacred Ark from that time to this. Is it unreasonable, then, to believe that Jeremiah did actually take this Ark from the temple when he took the tables of stone? And is it reasonable to suppose "the tables of the law" would be taken from their sacred enclosure, and that enclosure be left empty and alone? And if this were so why was no mention made of it, either by the Babylonians or by Cyrus, or by Josephus? To me it seems most certain that the Ark and its sacred contents were never separated; and that this Ark, whose tables of stone had the law written thereon by the finger of God, cannot be lost, but that the same divine care that has watched over His people in all their wanderings, will surely bring to light this Ark of the Covenant. How can it be otherwise?

And I rejoice to know that I am not alone in this expectation. For already an effort is being made in England and Scotland to raise funds enough wherewith to purchase the "Hill of Tara," and there explore that mausoleum, that covers the dust of Queen Tephi, with the full hope of finding that long lost sacred Ark of the Covenant.

Let us now return to the tribes left in Assyria, on the river Gozan.

These tribes while remaining in Assyria were known by the several names of Cymri, Saxonæ, Angles, Jutes and Gauls. These several names have all been traced back into Palestine or Canaan, viz: Cymri is said to be none other than Samaria, the capital of the ten tribed Israel. Hence the names of a great many places where the Cymri dwelt, such as the Crimea of the Bosphorus; the Crimea of Gothland; Cambria in France; Cumberland in England, and the Cumries in Scotland. The name Saxon is said to be derived from the Hebrew term "Isaac," thence Saxæ, next Saxanæ, by which last term they were known at the time of their migration out of Assyria. So of all these other names.

Some fifty years ago the inquiry was raised in England as to

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"Who are the Anglo-Saxons; where did they come from and who were their ancestors?" This inquiry Sharon Turner undertook to answer. After consulting all histories, both ancient and modern, within his reach, he began tracing them back over the route they had come from the East, until finally he brought up in Assyria, in the cities of the Medes, on the river Gozan, the very place where the Israelites were planted by Shalmaneser, who carried them captive from Samaria, their capital. Here he left them, because he could go no further, not knowing or even dreaming that he had thus "identified" the lost tribes of Israel, for the thought of their being such had, as yet, entered the head of no man living, much less his own. This work of Sharon Turner's seems to have remained unnoticed until a recent date, when one and another, but especially Edward Hine in his investigations on this subject, found here the very key to the origin of the Anglo-Saxons; that they were indeed the "Lost Tribes of Israel."

Now we find that some centuries B. C. these Anglo-Saxons, etc., began their migrations, and in all cases their movement was westward. Why was this? Why should they all, Dan, Simeon and all the rest, set their faces westward, and thus pursue their wanderings? Had there been given any divine command or any prophetic intimation directing them in this westward flight? No history, either sacred or profane, had at the time of their captivity uttered the first word of the future course to be pursued. But after their captivity the prophets Isaiah, Jeremiah and Ezekiel, together with all the minor prophets, proclaimed from the divine command that Israel was to be planted in the islands of the seas, in the far west and north; that there they were to rest; that during the time of their migration hither "The children of Israel shall abide many days without a king, and without a prince, and without a sacrifice," but "afterward shall the children of Israel return and seek the Lord their God, and David their king; and shall fear the Lord and His goodness in the latter days.—Hosea iii: 4–5. And also, "I will sift you among all nations as corn is sifted, yet not a grain shall be lost." These with many other similar predictions were uttered by the prophets

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after Israel was carried away captive into Assyria, but no one of them had ever reached the ears of any one of the thousands of the captives of Israel in all their wanderings.

But the faithful covenant-keeping God who had promised Jacob "Though I make a full end of all nations whither I have driven you, yet not a hair of your head shall be lost." That faithful God, therefore, by an unseen hand, led his people in all their wanderings, as truly as he had led Abram long before to a land, he not knowing whither he went. So in like manner all these ten tribes of Israel were led, they knew not why nor whither, away to the islands of the western seas, "where they were to rest and be increased, till they had become a mighty people," and in the end all the promises made to the fathers should be literally fulfilled, and fulfilled in themselves the very children of Israel, the lost ten tribes! How wondrous are the ways of God; that amazing love, love unknown! When Christ came He said, "I am not sent but to the lost sheep of the house of Israel." And in giving charge to His disciples He said, "Go not into the way of the Gentiles, and into none of the cities of the Samaritans enter ye; but go rather to the lost sheep of the house of Israel." In obedience to this divine injunction, we find the apostles going their several ways to the very regions of country where these ten tribes were now wandering, viz: Pontus, Galatia, Cappadocia, Bithynia, Macedonia, etc. Here they were looking out from the northwest point of Asia into Europe, seeking the land of their rest. And thus they were led on until the Anglo-Saxons were planted in Germany, where they must abide for a season, known only to Him who led Israel in the exodus out of Egypt. But hitherto are they led without the loss of the least of their tribes.

THE ANGLO-SAXONS ENTER ENGLAND.

Now we have reached ground traversed by the historians of England, viz: Hume, Macaulay, Knight, etc. These all have to begin about A. D. 1, soon after the ingress of Julius Cæsar into England. The history of England it is not necessary to repeat until about A. D. 440, when the Anglo-Saxons were induced, from various considerations, to come over into England,

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where some of their brethren had been for a long time, even from the first settlement of that country. For it is conceded by all that the original inhabitants of these islands were the Celts, the Gauls, the Picts, and Scots, etc. But who these various tribes were, the Anglo-Saxons were totally ignorant. Yet we have seen above that all these were none other than some of the very ten tribes. Here, then, the Anglo-Saxons came, and soon established the heptarchy—some say an ochtarchy—just agreeing with the number of tribes concealed away in their body. Yet they knew not what they did. They builded better than they knew.

Here they began to grow and to prosper, until about A. D. 800, when these petty kingdoms were all consolidated, and Egbert was crowned king of England. In this form the government was continued, in peace and apparent quietness, until the erruption of the Danes in their piratical invasion, which continued till in A. D. about 1030. But who were these Danes? Ah! they were none other than the descendants of Dan, whom we had traced in their migrations from Assyria through the north of Europe to their final settlement in Denmark.

But what is the next scene in the development of this divine but wondrous drama? At this time we find a kingdom of great power had grown up in Normandy (now France) which was stretching out its right hand about to seize the crown of England. Soon William the Conqueror, at the head of his mighty army, crossed over and landed in England, and at the battle of Hastings gained a complete victory, and thus capped the climax by placing the crown of England on his own head.

But this William the Conqueror, who is he, and whence his origin? Evidence seems to point in one way only—that these Normans were indeed the very tribe of Benjamin!

Here, then, we have assembled the ten tribes—yes, the eleven tribes, counting the tribe of Manasseh—as one. These possess England, Scotland, Wales and North Ireland. But not one of them all is found to have any knowledge of his own origin, or that of any of his neighbors. And here this people, under this government of Great Britain, continue to grow—"to lengthen

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their cords and strengthen their stakes"—having never been conquered in battle, either by land or by sea, up to the present time, A. D. 1884.

FULFILLMENT OF PROPHECIES.—A FEW.

Concerning this subject, this may be said: that all the prophecies in the Bible, uttered by whomsoever or towards what people or kingdom soever, yet all have reference, directly or indirectly, to the fulfillment of the promises made by God to Abraham, Isaac and Jacob. Not a prophecy have I been able to find, after the most diligent search, which is not aimed at this end—*the building up of God's kingdom in this world;* for this is none other than the aim of those promises. Even the prophecies uttered against Egypt or Babylon, Assyria, Tyre or Moab, these all look to that very end, viz.: the fulfillment of the promise to the fathers; aside from this they thave no meaning; but, this end in view, they are all full of meaning, even the most minute prediction; for God never utters a prediction of mere empty words, as man often does, words containing nothing (*vox et preteria nihil*). Bearing this in mind, let us look at some of the prophecies concerning His people Israel.

Gen. xxvii, 29.—"Let people serve thee, and nations bow down to thee." This is a prophetic prediction uttered by one of the patriarchs himself in the very dawn of the kingdom of God; yet how manifestly this reaches out to the long distant nations, making them all tributary to this end. Again, "The nation and kingdom that will not serve thee shall perish; yea, those nations shall be utterly wasted."—Isa. lx, 12. This threatening prediction is given concerning God's ancient people Israel. Every nation and people is to render service to Israel, but those that refuse shall be utterly destroyed. Many other like predictions might be cited, but these are sufficient to this point.

We will now turn to another class of prophecies. "Yet the number of the children of Israel shall be as the sand of the sea, which cannot be measured or numbered."—Hosea i, 10. This prophecy was uttered about the time of the Assyrian captivity, when, to all human appearance, the whole nation of Israel

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would soon become extinct. But that very people, "the kingdom of Israel," not Judah, have now become so numerous as to outnumber any other nationality in the world.

Deut. xxviii, 12.—"Thou shalt lend unto many nations, but thou shalt not borrow." Where is the people to whom this will apply? Can it be said of any of the nations of Europe, they lend to many, but borrow from none? Is this true of France? Who can answer? Of Spain? Alas, who does not know that Spain is bankrupt? So of all other governments on the continent, is there any one of whom it can be said, "they lend to many, and borrow from none?" Such a nation cannot be found. But in the islands of the sea, how is it? What saith England? Is it not known the world over that the wealth of England is so great that she alone of all the nations on this globe does actually "lend to many nations, but that she borrows from none?" Is not this, then, one case in evidence that the Anglo-Saxons are indeed God's own chosen Israel? Again it is said: "Thy seed shall possess the gate of his enemies."—Gen. xxii, 17. Where shall we look for the fulfillment of this prophecy? What nation can be found of whom it can, in truth, be said, he possesses the gate of his enemies? This is to have the entire control, for whoever possesses the entrance to one's palace has most surely the control of all within and about the palace; and that nation that holds possession of the *gate* of *his* enemy, how can it be that he has not the control of that enemy?

Now, England does, in fact, possess the gate of all her enemies the world over. But can this be said of any other nation of Europe, or of the entire world? Here, then, we have another case of the fulfillment of God's promises to Abraham, etc.

Again, it was promised to Abraham that in his seed all nations of the earth should be blessed. Now, this promise must embrace blessings both spiritual and temporal.

We have seen already that the Anglo-Saxons are indeed the seed of Abraham. Let us next learn what is true as to the blessings, of a temporal kind, bestowed by this people on the nations of the world. And here does it need the knowledge of all history to show that the chief blessings of civil and religious liberty now enjoyed throughout the world have been de-

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rived mainly from the Anglo-Saxon race? And then more especially is this true as it regards spiritual blessings. But what are we to understand by the term "spiritual blessings?" The meaning which *I* apply to this term is: that system of religion taught in the Bible, as set forth in both the Old Testaments and in the New. What nation then, or people, have fulfilled the promise to Abraham in this particular? Let us see. Who are the missionaries that are now proclaiming, in all parts of the world, the great salvation? Who are they and whence do they come? All who are familiar with this subject know full well that the missionary spirit seemed to have had a direct and divine inspiration infused into this Anglo-Saxon race, both in England and in America, at a period early in the present century. Their missionary societies were formed first in England, afterwards in America, and from these two sources have sprung all the streams of missionary influence now blessing the world. And can any one point to a single missionary in any part of the world who was not sent out through this Anglo-Saxon influence? It has been objected, indeed, that several missionaries have gone out from Germany. Yes, but who are these? Did they not go from Saxony, the very home of the Anglo-Saxons? And was not Luther of the very marrow of the Anglo-Saxon race? Let him say nay who can. So of the Huguenots, can any one show, by any *probable* evidence, that they are not of the tribe of Benjamin, *i. e.*, of William the Conqueror's men? What, then, do we find? Is it not this: that the great company of preachers in all parts of the world are Anglo-Saxons, directly or indirectly? And these are unlike the missionaries of any other religious order in the world, in this: that they all carry an open Bible, thus distinguishing themselves from the Jesuit missionaries.

And now what about the Bible? The voice of the living preacher, though ever so eloquent, is soon lost in the silence of the air if he go alone and have not the oracles of God, the Bible, in his hand, and presented also to all his people. What, then, has this Anglo-Saxon race done with the Bible? First, they have not only sent each and every missionary with a Bible in his hand, and charged the same to make these Bible teach-

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ings known the world around, but they have translated this blessed book into all the principal languages of the world, and then printed and sent abroad, like the leaves of the forest, so that to-day there is not a nation or tribe known on the face of the earth now destitute of a copy of the Bible.

Again, in Deut. vi, 7-9, it is enjoined to God's people Israel: "Thou shalt teach them diligently to thy children, and shalt talk of them when thou sittest in thine house; and when thou walkest by the way, and when thou liest down, and when thou risest up. . . . And thou shalt write them upon the posts of thy house, and on thy gates."

Now, this has been done *literally* by the Anglo-Saxon race, wherever found, whether in England or in America, or in the islands of the seas afar off in the remotest parts of the world. But what other peoples have done this? Does the history of the world give any clue to the name of such a people? Has not this case, then, some showing that the Anglo-Saxons are the identical Israel of God? What can be more evident? If any one can tell, let him speak.

THE BLESSING OF JOSEPH'S SONS BY JACOB.

The closing scene of Jacob's life—one of the most beautiful ever recorded—is contained in the 48th and 49th chapters of Genesis. This whole account I recommend to careful perusal by every one who desires to get a thorough understanding of the prophetic predictions uttered by Jacob, under the divine inspiration then given him. The special topic to which our attention shall now be directed is the blessing Jacob gave to the two sons of Joseph.

When about to die, Jacob called for these sons of Joseph that he might bless them. And Joseph approached his Father, bringing his two sons, placing Manasseh, the elder, at Jacob's right hand, and Ephraim at his left hand, that each might receive the blessing according to his age, the right of primogeniture belonging to the elder son. But Jacob, stretching out his hands, crosses them, and places his right hand on the head of Ephraim. But this displeases Joseph, who lifts up his father's hand, saying at the same time, "*this* is the older." "I know

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it, my son; I know it," says Jacob. Then he pronounces the blessing. First, "that they shall *grow* to a multitude in the midst of the earth." This term *grow* is rendered in the margin of the Bible, *as fishes do increase*, spawning by the millions. Then he pronounces the blessing that Manasseh shall become a great nation, but not like Ephraim. Ephraim's seed shall "become a multitude of nations." Here, then, we have the blessing stated definitely that Manasseh should "become a great people," but Ephraim "a multitude of nations." Is it possible now to find the fulfillment of these predictions—not something approximating toward a probable fulfillment, for these cases admit of nothing but the most exact and literal fulfillment? Let us see then how the case stands. What are the facts?

These two sons, Ephraim and Manasseh, we have found to be dwelling with the Anglo-Saxons; that with them they came into England; that there they have gained a permanent residence, and that these Anglo-Saxons are none other than the lost tribes of Israel. We find, also, that "Ephraim" is often used as "Israel" by the prophets, and particularly in Ezkiel xxxvii, 15-20, where Ephraim is declared to stand for the head of the house of Israel, to lead Judah back to Jerusalem.

Ephraim, then, represents the head of the English nation. What, now, has England, *i. e.*, the government of Great Britain, to show as meeting the conditions of Jacob's prophecy?

First, there is the home government of Great Britain; next there is Canada, a large nation of several millions; then the West India Islands is another; then crossing over the Atlantic to the west coast of Africa is another assemblage of colonies, making a government; proceeding on to South Africa, there we find two large nationalities; from here we sail into the south seas, where we find Australia, Tasmania and New Zealand, three large nationalities; thence we take our flight northward to India, where we find more than two hundred millions of people, embracing eleven (some say sixteen) distinct nationalities, all recognizing the government of Great Britain, and Victoria as their Empress. Then, still further, islands of the Pacific hold other settlements of Anglo-Saxons, so that historians now

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tell us that the British government has, within the bounds of its empire, sixty different colonies—nationalities of people.

Now, what have any or all the governments of Europe got to show on this subject as an offset to this exhibition of Great Britain? Let us see.

France has her home government, and once held by her forts much of the country from the Gulf of St. Lawrence to the Gulf of Mexico. But where are these possessions now? Alas, they have long since been absorbed by Ephraim.

Well, Spain; what of her? Spain once extended her sway over the entire continent of North and South America, and had her colonies planted from one end to the other. But where are they now? All have vanished like bubbles on the ocean's wave.

Italy, then, from the great iron Roman empire, what of her? Ah, Italy indeed, she is herself but just born, and that out of the smoldering dust of old Rome. She has nothing but her own infantile self. So of all the other governments of Europe is there one that can show a single item, claiming to the fulfillment of the promise made to Ephraim! But in the government of Great Britain we have found that she has grown, literally, into "a multitude of nations." Now, it may be asked with confidence, is it possible to specify the wanting of the least thing as a failure to the fulfillment of Ephraim's blessing, even to the crossing of a *t*, or the dotting of an *i*? If so, let that be shown? If, then, a prophecy is fulfilled to the very letter, a prophecy in which is wrapped up the great blessings of the world, for which we have long been praying, though we knew not why, need we hesitate when we find the veriest fulfillment of the prophecy staring us fully in the face—need we hesitate to receive it? Alas, this only can be from our blindness—our weak faith—our want of confidence in the certain fulfillment of God's word, that He will fulfill to the very letter all his promises. For He says, "If the ordinance of night and day shall fail, then shall my promise to Israel fail of its accomplishment." No, the trouble is, we have so long been accustomed to the spiritual interpretations of all the promises made concerning Israel, the nation of Israel I mean, notwithstanding the repeated assertions of God himself to the

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contrary, that we stagger and hesitate when we see the fulfillment palpably before our eyes. As for myself I can conceive of no more, I can ask for no more perfect fulfillment of the promised blessing made to Ephraim than is here shown to be found in the government of Great Britain.

Manasseh, can we find a like fulfillment of the prophecy made to him.

In examining the prophecies made to these two sons of Joseph, we observe a marked difference; the one was to "grow into a multitude of nations," the other was to be confined to one nation, yet its greatness unlimited. With this destination in mind we will proceed.

It will be remembered by all who are familiar with the history of England, that Wycliffe published a transalation of the Bible in English about A. D. 1380. This was received and read with absorbing interest; that about 1526 A. D. Tyndall published his more perfect translation, which was grasped by the multitude as the very manna from heaven. The reading of this work produced what were called the Puritans. This edition of the Bible was soon confiscated by the Papal power which then held sway in England, and Tyndall himself put to death. But the seed thus sown could not die here. Henry VIII., then at war with the Pope, soon published a small edition of the Bible, about three hundred copies if I am not mistaken, all of which he distributed to the various parishes, to be chained in the chancel of the churches, to be read by any one who desired to do so. After this Elizabeth published the "Bishop's Bible," which gave an increase in the circulation of the Scriptures. But this only prepared the way for the publishing of "King James' Bible," which is our present copy of the Scriptures. On this translation there was no prohibition; and hence the Bible was studied with the intensest thought. The Puritans, therefore, became more numerous, Cromwell among the rest; and A. D. 1620 a company of about one hundred and three was formed, and put into a little vessel called the "Mayflower," which was started out to sea, its course being directed by some unseen hand, till at length this little band were landed on Plymouth Rock in the dead of winter.

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Who could have devised such a plan? Surely, no human wisdom would have risked its reputation in such a scheme! But in all this movement there stood a wiser counsellor than earth affords. Here was to be planted the germ of that "great nation" predicted by Jacob to Manasseh.

Let us see then what became of that little band of Pilgrims. Why, the first winter buried the half of them in death! This certainly does not look much like the "growing into a mighty nation." But "God's ways are not always man's ways, neither are His thoughts our thoughts." Here this germ, this little branch, taken from the tree of Liberty in England, is transplanted in a virgin soil, where it has unlimited power of growth, and "none to molest or make afraid." And what do we find to-day? Here we see what the world can show the like of nowhere else. This little germ, almost killed by the first winter's frosts, has sprouted up, and grown and grown until its branches now reach from the Atlantic to the Pacific, and its roots extend throughout all the land from the North to the South! This tree of Liberty, the cynosure of all nations, why are such multitudes flocking hither? Who can tell? Let him answer who can. This whole affair—what is it but a perfect enigma to human view? But looking through the divine telescope all darkness flees away, and the very stars of the last magnitude stand out with minute distinctness. Yes! God is fulfilling His promises. He is not dead, neither has He forgotten His covenant. His faithfulness shall not fail till every jot and tittle of all He has promised to Israel, by the mouth of all His prophets, shall be accomplished.

Here, then, in America, we find the conditions of the promise made to Manasseh fulfilled to the very letter. And if they are not here, where shall we look? In what part of the world to find their fulfillment? Or where shall the man be found that will undertake, either by his own wisdom, or the wisdom of all the world combined, to delineate a more perfect fulfillment of Manasseh's promise?

NEBUCHADNEZZAR'S DREAM.

In Daniel ii. is the account of a wonderful dream had by the king, and which greatly troubled him. And having lost the

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true outline of the dream, the king summoned all the astrologers and soothsayers, demanding of them to make known to him both the dream and the interpretation thereof. And this must be done or death should be their portion. On the approach of the officer to whom this business was entrusted, Daniel inquired, "Why is the king so hasty?" giving the officer to understand that he could, by the divine aid, answer the king's demand.

The result was that Daniel was brought before the king, and there told the king his dream, specifying its minutest appearance; and afterward its interpretation. The dream was the appearance of a great image, whose head was gold, its breast and arms were silver, its belly and its thighs of brass, its legs of iron, its feet of part iron and part clay. Then a stone cut out without hands, smote the image on the feet and broke them to pieces. Then this whole image became like the chaff of the threshing floor, scattered and found no more, and the stone became a great mountain and filled the world.

The interpretation of the dream, says Daniel, is this: "Thou, Nebuchadnezzar, art this head of gold. After thee shall another kingdom, inferior, come; a third of brass, which shall bear rule over all the earth. And the fourth kingdom shall be strong as iron, . . . and shall break in pieces and bruise; and the toes of the feet, part of iron and part of clay; the kingdom shall be partly strong and partly broken. . . And in the days of these kings shall the God of heaven set up a kingdom, which shall never be destroyed; and this kingdom shall not be left to other people, but it shall break in pieces and consume all these kingdoms, and it shall stand forever. "For as much as thou sawest that the stone was cut out of the mountain without hands, and that it break in pieces the iron, the clay, the brass, the silver and the gold, the great God hath made known to the king what shall come to pass hereafter, and the dream is certain and the interpretation thereof sure."

Here we have an outline, given by divine inspiration, of what is to transpire, down to the end of time. And the explanation of this dream is given in such terms as to have secured the entire consent of commentators in nearly every particular.

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All agree that the Babylonish kingdom represents the head of gold; that the Medo-Persian kingdom represents the arms and breast of silver; that the Grecian kingdom, under Alexander, the brass; and that the Roman kingdom, in its kingly and its imperial form, represents the iron. But strange as it now may seem, the mass of commentators have given to the stone a different meaning than what is given to the other parts of the great image. All these parts, from the head to the feet, represent kingdoms, *i. e.*, nations of peoples. Why, then, should the stone be taken to represent Christ, as it has been by multitudes? Does not Daniel say expressly that this stone represents a kingdom (of peoples) which the God of heaven will set up in those days, and that this kingdom will not be left to other peoples, but it shall stand forever? What can be more evident than that the stone represents a kingdom of human beings (of peoples) the same as the other kingdoms? To me, indeed, it seems most evident; the only difference there is being in the character of this people constituting this stone kingdom.

Where now shall we look for a people whom the God of heaven shall set up as His kingdom and which shall stand forever, consuming all other kingdoms represented by the great image? Has God a chosen people, a peculiar people, separated from all the peoples of the world, and which people he calls His own? Has He not said that this people shall not be destroyed, that though he should make an end of all nations among which He would scatter his people, yet he would not make a full end of Israel, but Israel should continue His own distinct people to the end of time, and that this very people were to become, in the latter day, like the sands of the sea "which cannot be measured nor numbered?" All this He has declared by the mouth of His many prophets, over and over again, and confirmed all with His own infallible oath, that the heavens and the earth should perish, yet not one jot or tittle of His word should fail." What can be stronger than this? What can be conceived more sure and everlasting?

There must be some nation of peoples now somewhere to answer to this stone kingdom which the God of heaven was to

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set up "in those days." But that people must be His own people, and not some strange or unknown people.

Now it has been proved above, if it is possible to prove anything respecting the fulfillment of prophecies, that the Anglo-Saxon race are indeed the identical descendants of the lost ten tribes of Israel. If this has not been proved, then nothing can be proved. If so, how can it be proved that such a person as Abraham ever lived, or Isaac, or Jacob, or Moses, or David, or Solomon, or any other person mentioned in the Scriptures, even Jesus Christ himself?

Now, I think it can be shown conclusively that the government of Great Britain, the English speaking people, is the very nation represented by the stone.

At the time of the migration of the Anglo-Saxons into England, about A. D. 440, there was established a heptarchy, some say an octarchy, *i. e.*, petty governments ruled by chiefs, in number equal to the numbers of tribes then concealed in that Anglo-Saxon body. Yet this was known to no one of their number at the time, for they had lost all knowledge of their own identity in every respect; but they builded better than they knew, and thus under the divine guidance—the same that led Israel out of Egypt and in the wilderness—they here laid the foundations of a government that is to stand forever. Under this heptarchy they began to grow, until A. D. 800 these seven little kingdoms were all amalgamated into one kingdom, and the crown placed upon the head of Egbert, the first king. From this little germ that nation has been growing, slowly at first but increasing with the lapse of time, growing with greater strength as time advances. Indeed, historians tell us that, unlike all other nations of Europe, England has never been conquered in battle, either by sea or land, up to the present time!! And to-day England is "at the head and not at the tail of all nations;" that she (the Anglo-Saxon race) is permeating all the nations of the world by her influence, and that her sixty colonies do now girdle the world.

Where, then, can we put down our finger and say, here is a point wanting its fulfillment on God's kingdom of stone? Indeed, is it possible to find any, the least iota, which has not

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its literal fulfillment in the stone kingdom up to this time? The end is not yet.

Let us now review the ground we have gone over, and ascertain, if possible, what we have found:

1. First, we have found that God made a covenant promise with our fathers, Abraham, Isaac and Jacob, by which He secured to them and to their posterity *(a)* the everlasting possession of the whole land of Canaan, extending from the river of Egypt even unto the great river Euphrates.

(*b.*) A progeny numerous, beyond computation, which was to pervade all nations.

(*c.*) A race of kings reaching down to the end of time.

(*d.*) That all nations of the world were to be blessed in, and through this Israelitish nation.

(*e.*) And finally that he would never leave nor forsake His people till he had accomplished, to the minutest article, everything promised in the covenant.

2. We have found, in our examination of the divine providences towards His people, that Israel was led, in all things, under the direction of that promise, down to Egypt, thence out of Egypt, through the wilderness, into the land of Canaan, the country of their inheritance; that here every tribe had its lot assigned, and this lot was occupied in accordance with the divine decree; that here the nation began to take root and become great, first under Joshua, then under Judges 400 years. At length they demanded a king, like other nations, which was given them, Saul being the one selected as their king. The successors to Saul were David, and next Solomon, who builded the Temple, God's House; that after Solomon came Rehoboam his son, under whose reign the kingdom was broken in two, and hence became two nations—viz., the nation of Judah, formed of the two tribes, Judah and Levi, which is from this time called the Kingdom of Judah. The other of ten tribes, was called the kingdom of Israel, whose capital was Samarica, but Judah's capital was Jerusalem.

These two kingdoms continued, each in its separate existence, till A. D. 724 (about), when the kingdom of Israel, on account of its great idolatry, was besieged by the Assyrian king; their

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capital was destroyed, and the nation captured and carried away to Assyria, and placed in the cities of the Medes, on the river Gozan. Here they were "Lost." Lost to the world, but not to God.

3. Next, we have found these ten tribes, that constituted the kingdom of Israel, all located in the isles of the sea, in the far N. W., according to the prophetic predictions. First, Dan to Simeon, whom we found to have been acquainted with the country, by employment under Solomon, in transporting tin, etc., from England in A. D. 1,000; these, Dan and Simeon, took ships and sailed away to Ireland, Dan locating on the North of Ireland, and Simeon settling in Wales.

4. The other branch of Dan, we found to have wandered off from Assyria, leaving his name at every encampment he made, till his final settlement in Denmark.

5. Next, we found the tribes that were still in Assyria had received the name and were called Anglo-Saxons while there. And that these tribes were conducted by an unseen hand first, into Germany, next into England, where they became permanently located, and where they established the heptarchy, A. D. 500. And about A. D. 800 these governments were all united under one head, and Egbert was crowned their king.

6. Finally, "William the Conqueror," the leader of the tribe of Benjamin, comes in from Normandy, and at the battle of Hastings is crowned king of the ten tribes, all congregated here in the English Government, called now, and for long time to come, the Anglo-Saxons.

7. We have found the promise of Jacob to the two sons of Joseph literally fulfilled—viz., that Ephraim was to become a multitude of nations, and Manasseh a great nation, Ephraim's promise is found to be literally fulfilled in the government of Great Britain, with her sixty colonies; while Manasseh stands equally crowned in the United States of America.

8. And, again, we have found all the nations of the world being now blessed, politically, financially and religiously. Hence, we find that the interpretation of Nebuchadnezzar's dream has its perfect fulfillment in the government of Great Britain, or rather in the Anglo-Saxon race.

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Here then we reach the final conclusion, and find, in every particular, embracing every iota, the promise made to the fathers, and the prophecies uttered by the prophets concerning lost Israel.

What now shall we do with this exposition? Shall we receive it or not? Indeed, what more can be asked? What more can be conceived? Have not the promises, the prophetic predictions, been all verified up to this time? Can anyone specify the least thing, and say, this has not been fulfilled? Indeed, the fulfillment in all things is so marked that the world may be challenged to write out a more exact fulfillment of these prophecies up to the present time than we have found actually to have taken place in our review.

As to the future we are not anxious to enquire, and we will not speculate, for the history of the world shows that all such speculation is vain, for no one knows how God will fulfill his promises. Is it not most manifest that of all those who have written upon the fulfillment of future prophecies, not one has hit the nail on the head. The actual fulfillment not being what the theory supposed it would be! How foolish, then, to speculate on the fulfillment of future prophecies.

There are many prophecies yet to be fulfilled, such as this, Isa. xi: 11, "And it shall come to pass in that day that the Lord shall set his hand again the second time to recover the remnant of His people," etc. But when He will do this, or by what agencies it is to be accomplished, He has not told us.

Also, the great battle of Armageddon, or Gog and Magog, we are assured shall be fought, and the utter defeat of God's enemies is predicted; but the exact time of this battle, or how it is to be engineered by the commander of the diabolical hosts, God has not revealed to man—only the certainty of the event. So also He has promised, Jer. xxxi: 31–35: "Behold the days come, saith the Lord, that I will make a new covenant with the house of Israel, and with the house of Judah. . . . . I will put my law in their inward parts, and write it in their hearts. . . . . And they shall teach no more every man his brother, saying 'know the Lord,' for they shall all know me from the least to the greatest of them, saith the Lord; for

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I will forgive their iniquity, and I will remember their sin no more!"

Now, this promise has certainly not yet been fulfilled. But the time is coming when it shall be fulfilled to the very letter; but when the exact time, or how this is to be accomplished, we know not, only we are assured that God is to be the chief actor in this wonderful drama.

What wonderful events, then, seem about to break upon the world! These many and great prophecies which stand struggling for admission at the very door! But which of all these shall enter first, or how long shall be the time of its fulfillment, who can tell? Then, when these shall have been accomplished, what next? Ah, what but the glorious appearing of the Great Lord, our Saviour, Jesus Christ, even in that very form He went away with, vanishing from the gaze of His disciples! Even so, "come Lord Jesus, come quickly."

E. P. INGERSOLL.

June, 1884, A. D.

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THE SPHINX.

This well known monument ranks next to the Pyramid, not only in location but in interest; and yet theory has so far failed to cover its mysteries, and research has been lost in the clouds of sand that overwhelm both fact and fancy, while poetry in terming this monster "a watcher at a tomb" has shown her usual indifference to truth. The Pyramid, which it watches, being only a "tomb" in so far as it is a type of a resurrection, holding within itself a revelation. There is no need to say here that this "revelation" is already lighting the path of knowledge on which many are running to and fro.

What, then, is this mystery that, unlike its solemn neighbor, has no voice but in its outward form? Of what is it typical? Does it tell of past or future? Does it commemorate an era, or does the cartouch of a king confine its history to the life of one human being? If I may be pardoned for a repetition of what is already known, the collection of facts will aid in the formation of an opinion on the subject.

Its form has, until recently, been considered as a union of a woman and a lion. As now partly visible above the sand, the giant head gives little indication of either. The face is mutilated, the nose is said to be in the Berlin Museum, the beard has fallen off, the serene beauty of which we have heard is lost among the attacks of friends and enemies, and late travellers irreverently compare it to some nondescript animal. It is pathetic in its helpless ruin and in its powerless protest against the cruel sand. Let us try to imagine it as it appeared to the worshippers of Horus, and judge whether it was not worthy to have been designed by the same great architect who planned the Pyramid, and a monument of the same race of builders.

One of the earlier travellers (Belzoni in 1815–'19) found traces of a pavement which he thought surrounded the Pyramid, and on which, he says, were erected the three great monuments to

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which he ascribes the same date. These are the largest Pyramid, the Temple on the east side, and the Sphinx on the extreme southeastern edge of the platform or pavement. This pavement is strangely spoken of in "J. E. Perring's Report" (1839) as having been "discovered by Colonel Howard Vyse, while endeavoring to find the lower entrance passage to the subterraneous apartment, in which, according to Herodotus, the body of Cheops was deposited on an island surrounded by the waters of the Nile." Perring says the pavement is 1 foot 9 inches in thickness, and extended in the centre 33 feet 6 inches beyond the original base, but at the excavations eastward and westward of the centre it was not more than 12 or 13 feet wide. The stones he says are "carefully and beautifully fitted together."

This measurement would not admit of the Sphinx being upon the pavement, but that can only be decided by those who have examined it in reference to the settlement of this question. He also says that the plane at the base of the rock on which the pyramids of Gizeh stand was probably cultivated, but from the accumulation of sand from the desert it is now above the reach of the annual inundation of the Nile. This I quote from what Professor Symth terms "that excellent, though unwieldy and seldom consulted folio of enormous plates," which lies open before me, and which I have vainly examined to determine the exact distance of the Sphinx from the Pyramid. Whether this monument is or is not on the pavement, it certainly is on the same rock as the pyramids, and this is stated to be 150 feet above the desert level. Its position indicates a reference to the Pyramid, being—according to Perring's survey—placed diagonally from its southeast corner, facing east, and stretching out its huge paws towards the Nile. In the 'History of Egypt,' by Samuel Thorpe, the author says of this "lion with a man's head, there were probably two of these monsters, one on each side of the Pyramid, and probably of the same age of the Pyramid they were intended to ornament." If another existed, or was projected, on the northeast corner, their connection with the pyramid idea would be proved, and the approach from the Nile would be something unsurpassed in magnificence. What

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this approach was we can imagine by the aid of Captain Caviglia, or accept with the reproduction of gorgeous ceremonial as described by the Rev. J. H. Ingraham in his 'Israel in Bondage,' a book not recognized by scholars as he hoped it would be, and yet a work resulting from the study and research of the same authorities to which we must resort. His magnificent description is too long to quote. The immediate approach to the Sphinx was excavated by Captain Caviglia. He found a sloping descent of 135 feet cut in the rock, ending in a flight of 13 steps to a level platform, from which another flight of 13 steps led down to the temple which was placed between the fore paws. This descending approach heightened the impression of the magnitude of the Sphinx as it appeared to rise before the spectator. From the platform on which the feet rested to the top of the head was 62 feet, the extent of the paws 50 feet, and the whole length of the body 140. Kenrick says the whole body is excavated, except part of the back and the fore paws, which are covered with hewn stone; others assert that the whole figure is formed of hewn stones, and they discover the cement which joins them; this again is denied by those who see the veins of the rock in the apparent lines of cement. M. Maillot considers these lines as natural and not cement. Probably the fact is that the rock was used as far as possible, its deficiencies being made up by stone-work. In a note on the few words in whieh Herodotus dismisses the Sphinx, Savary says: "Opposite the second pyramid is the Sphinx, the whole body of which is buried in the sand; it is of a single stone, being part of the rock on which the pyramid stands." Ingraham states that it was made by a king of the oldest dynasty, who chiselled into these grand proportions a mass of rock which, projecting from the Lybian hills, nearly obstructed the view of the largest pyramid. He also speaks of it as "an andro-sphinx," crowned with a helmet, on which the sacred serpent was affixed, and as having "a great and full beard," and as being a deification of Chephres. In the description of Egypt, taken from the account of M. Maillot, French Consul at Cairo, 1735, we read, "This union of the head of a virgin (fille) with the body of a lion, so common among the representations that one

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meets in Egypt, was a symbol of that which is known in this country under the signs of Virgo and Leo."

This, according to the consul, is the annual inundation of the river Nile, and the fertilization of the soil by the action of the sun's rays upon the saturated earth, rendering Egypt fertile and habitable. "The kings of Egypt," he says, "knowing no better way to acknowledge to the sun their reverence for him as the author of their felicity, they consecrate to him this mysterious figure." The elder Pliny (book 36) says the Sphinx was looked upon as a divinity by the people, who said that King Harmais was buried in it, and that it was brought from a distance. He is, however, so very disrespectful to the pyramids that his testimony is not fully reliable. Of these gigantic monuments he says: "They are so many idle and frivolous pieces of ostentation of their resources on the part of the monarchs of Egypt." He asserts, however, that the Sphinx was hewn from a solid rock, and the face colored red, from a feeling of veneration. The circumference of the head around the forehead is given as 102 feet, and the height from the body to the top of the asp, or the summit of the head, as 62 feet. He does not speak of the mutilation of the nose, and we may hope that important feature was adding dignity to the face when he was there. The asp certainly was, and that was a part of the ornament of what is described as a crown or helmet. Wilkinson says (vol. 2, page 334) that "the allegorical connection between the Sphinx and the monarch is pointed out by its having the kingly beard as well as the crown and other symbols of royalty." This beard seems to have been discovered by Captain Caviglia, who revealed the magnificent approach. Sir Howard Vyse says (vol. 3, page 109): "Captain Caviglia discovered fragments of stone, on which was represented plaited hair. On seeing them I was led to imagine them parts of a beard, or at least of that singular appendage denominated a beard, and frequently attached to the chins of male personages in Egyptian sculpture." Wilkinson explains the forms of these appendages ('Ancient Egypt,' vol 2, page 332): "The most singular custom of these Egyptians was that of tying a false beard under the chin; it was made of plaited hair and of a peculiar form,

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according to the person by whom it was worn. Private individuals had a small beard scarcely two inches long; that of a king was of considerable length, square at the end, while the figures of gods were distinguished by its turning up at the end. No man ventured to assume or to affix to his image the beard of a deity, but after his death it was permitted to substitute this divine emblem on the statues of kings, and of all others who were judged worthy of admittance to the elysium of futurity, in consequence of their having assumed the character of Osiris, to whom the souls of the pure returned after leaving their earthly abode." The beard of the Sphinx (probably a later addition) according to the same author, and as before stated, indicates a king. This may, however, be called in question, and future discoveries reveal the turned up end, which would place our monster in the role of deities. Whatever be the shape of his or her beard, the greatest amount of testimony is in favor of the divinity of the Sphinx, or of its final deification. That it was an object of worship at some period is as nearly certain as anything that depends on testimony. Kenrick says: "A Sphinx is a representation of the monarch whose name it bears;" but Mariette Bey (in his Catalogue, page 270) quite reverses this decision in his description of one of the Sphinxes in the museum at Cairo, which does not bear the cartouch of the king who made it. He says: "By a sort of usurpation of which examples abound, these sovereigns successively ornamented this monument of San with their legends. These were Apappos, a shepherd king; Mêneptah, who put his inscription partly over that of Apappos; and Psousennis; so that the date of a Sphinx cannot be decided by a cartouche with any more certainty than the name of its builder, as the first king who appropriated it may have had no more right than the last." Pliny spoke of the red color of the face; this indicates a sacred purpose, as Pausanias, quoted by Sir Howard Vyse, says that in Egypt and in India this color was so applied. Diodorus speaks of a sacred book being inscribed in red characters, and says that its writers wore red dresses. Professor Smyth and Sir Howard Vyse speak of hieroglyphics on the Sphinx, but Kenrick says there were none on any part of it. They may

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have been on the tablets found with the small temple between the fore legs of the Sphinx. This temple was probably a later erection, when the original design of the monument was not clearly comprehended. In a history of Egypt by Samuel Thorpe the temple is said to have been built by Thothmosis IV., and that his figure was represented within the temple worshipping the Sphinx. The name Sphinx in ancient dialects means "the pouring out." It is not, however, the only name by which this monument is known. Bel-hit is the most significant, and means "the Lord who cometh." Hor-em-Khon is another, meaning "the sun on the horizon," or "in his resting place," while the modern name is Abou-houl, "the father of sand."

From these fragmentary testimonies we learn that this many-named monument, which presents to the eye a union of a human figure with that of a lion, traditionally symbolized certain blessings which something in that union brought to the earth. To the Egyptians the greatest blessings were derived from the inundation of the Nile, which begins at the summer solstice. The name Sphinx—which means "the pouring out"—(Mazzaroth)—holds this idea. The inundation not only represented to them the submerging of the desert and the material good in its restoration to fertility, but also the religious idea of the conquest of Typhon, the desert (or evil) by Osiris, the Nile (or good). We also find that this monument became an object of worship, divine honors being paid to it, and that it afterwards represented a deified king (perhaps from such national expression of feeling as placed Napoleon among the stars as Orion the Conqueror). Our interest is in the idea which may have originated the monster. A "monster" because the Egyptians and early builders indicated the importance of a thought by the ponderousness of its representation. Therefore in its size, as well as in its form and in its worship, we must seek the thought that underlies its erection.

Let us suppose the Sphinx to have been erected at, or near, the Pyramid date, and to have been designed by its builders—whom we believe were divinely endowed with a wisdom above that of the people whom they had conquered. Let us also

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remember that the pure religion of the Shepherd Kings had the same origin as that of the Egyptian idolators, both religions claiming a Noetic and Sethite source, and that it was in a certain degree astrological, although preserved from the lower forms of worship which turned the stars to deities, gave them human parts and passions, and bowed to the created instead of to the Creator. In proof of common astrological expressions, note the prophecy of Balaam, "a star out of Jacob, and sceptre out of Israel." A star is the Egyptian hieroglyph of a god, and a sceptre, of a king. So that both Israel and Egypt could read the coming of a god-king. Therefore if the Sphinx were erected by the Pyramid builders, the design may have been to symbolize a pure religious truth, although afterwards this very truth may have been desecrated by the later Egyptian mind without being entirely lost. Let us suppose this design was to symbolize an important era and to typify a future period of good. To prove this true it must combine all that Egypt has ever reverenced in this mysterious and solemn creature. We will examine it. The symbolical thought is the past era of the creation of the present race of men, with the promise of redemption under a coming king, and the typical thought is the future fulfillment of the promise in the reign of the king, who meanwhile conquers a peace. The Sphinx would then be an Alpha and Omega of the Pyramid thought. An Alpha in that it symbolizes the beginning of the earth's history in its week of work; an Omega in that it typifies the conquest of evil and the reign of the Lion of Judah in the earth's final Sabbath.

Taking the accepted era of this creation (I mean the completed preparation of the earth for the abode of the then created man) 4000 B. C., we find many traditions that it took place at the summer solstice. We learn that the sun at that date was at the junction of the constellations Leo and Virgo, where the bright star Denebola marks this junction. The word Denebola means the "lord or judge who cometh quickly"—(Mazzaroth), and corresponds to Bel-hit, which means "the lord who cometh," and is one of the most ancient names of the Sphinx. The commemorative monument would then unite the two

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zodiacal signs of Leo and Virgo. "The Lord," who is represented by the type of the sun, is leaving Leo, the place of his kingly power, and entering Virgo on a period of humiliation, then passing through the twelve stages of redemptive work, returns finally to the glory of the king in Leo, and in his passage through that typical constellation proclaims himself the conqueror of the serpent, the bringer of all blessings, the Lion of Judah, the Omega. (Mythologically we have the Hercules, astronomically the sun in his yearly course, religiously the God-King, the Virgin born.) The rising of the Nile at the period of the summer solstice, is a sign of the conquest of evil and of the blessings of fertility confered on the earth, through the power of the Hor-em-Khon, "the sun in his resting place." Would it then be a thought unworthy of the Pyramid builders to place before their great conservatory of truth a symbol of the sun's place at that creation, and to show in it the prophecy of a Christ without whom creation would be a curse?

We are here met by the difficult fact that the head of the Sphinx is that of a king, not even of the crowned woman of the skies, still less of the Virgin. This is susceptible of two explanations. One is to leave out the constellation of Virgo altogether, and consider the Sphinx as representing only the Lion King of Judah. This would be satisfactory were it not that the woman appears traditionally in the Sphinx, and that the Greeks, who must have had some reason for it, represent their Sphinx always as uniting a woman and a lion. To reconcile these two ideas, we consider Virgo as symbolically the mother of humanity in being the mother of a divine son in whom humanity is represented as "neither male nor female, but one in Christ Jesus." If this is objected to, the constellation Virgo may represent the humiliation of the king who humbled himself to be born of a virgin, and this humiliation he represented by the man-headed lion seated immovably upon the earth.

If the Sphinx marked this year, let us read the figurative story by the position of the sun at the solstitial and equinoctial points. To Christ leaving His kingly power in Leo, and entering the constellation of Virgo, is given the longest day.

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His work has dawned upon the earth. An era, a year-day has begun. The Hor-em-Khon, "the sun in his resting place," or "on the horizon," indicates rest in the work of creation, and progress in the beginning of a new day.

To the Holy Spirit, as figured by Aquarius, pouring out the water upon the multitude of fishes—represented by Pisces—is given the shortest day, his work being then subordinate to that of Christ.

The autumnal equinox prefiguring the approaching winter of death, would be at the union of Scorpio and Sagittarius. The arrow of the archer pointing to the red star, Antares—the wounding—in the head of the serpent.

The vernal equinox, the period of hope, would be between Taurus and Gemini. The sun leaving the court of glory gathered around Al Cyone—the centre—and travelling onward to the long day of the triumph of Judah's Lion.

This year, 4,000 B. C., is worthy of commemoration. It was well done to place a symbol in imperishable stone to await the dawn of the "Day of the Lord," to gaze unmoved by friend or foe on the daily typical wonder of the rising sun.

In further confirmation of the commemoration of this era, we find its record on some ancient Egyptian zodiacs. The zodiac of Erni places the summer solstice between Leo and Virgo, and the winter solstice between Aquarius and Pisces. At the sign Virgo is placed the crowned Sphinx, over a serpent of the venomous species, with a flat head. (Mazzaroth, page 23.)

In the planisphere of Dendara, the lion is also over a serpent, but it is not of a venomous kind, having a pointed head, and therefore may represent the sun's course; a dove is also combined in the sign, the Virgin is holding a branch, but a female figure in the explanatory decan holds a child. The summer solstice is represented as being at this place by a figure holding a vase, thus representing the inundation of the Nile. To the Egyptian mind the summer solstice and the inundation were inseparable. The place of the winter solstice is marked in Aquarius by a headless horse, its well known type, so that there is little doubt that this planisphere commemorates this year. (Certain changes and indications in this planisphere sug-

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gest it having been altered for a horoscope. This would not invalidate the original design in Mazzaroth, page 16.)

There is another New Year's day, still more wonderful, commemorated by the Sphinx. It is that of the Annus Magnus, the ending of which will be in the far-off ages when olams on olams shall have passed. The opening of that year would tell the same star story that has been already read, but in the progressive record of its passing months the changing position of the colures tell us that "night unto night showeth knowledge, there is no speech where their voice hath not been heard, into all the earth hath their line gone forth and to the end of the world their sayings." (Young's version.) The length of this cycle is variously given. By H. Gratten Guiness it is computed at 25,847 years, and an interesting calculation made which proves the present length of human life to equal one day of this great year. ('Approaching End of the Age,' p. 552.) There is no need to explain the precession of the equinoxes to our readers, but it may not have occurred to them to note the progressive revelation of the changing colures. Many nations have celebrated this year by the feast of the Taurobilium, our May day. Maurice says: "I have little doubt that May day, or the day on which the sun entered Taurus, has been immemorially kept as a sacred feast from the creation of the earth and man, and was originally intended as a memorial of that auspicious period." Other traditions tell us that at sometime in the antediluvian days the colures were marked by the stars: Al Debaran, the governor; Regulus, the treading under foot; Antares, the wounding, and Tom-al-Taut, the mouth of the fish. The colures had then receded from the entrance of the constellations to the positions of these stars, long known as Royal Stars. Another tradition tells of a feast which, like the Taurobilium, we still observe, was the Criobilium. This must have commemorated the entrance of the sun at the vernal equinox into the constellation Aries, the Ram. April fool's day is said to mark this change, the event probably being a surprise to the early astronomers, and the custom of sending on fools' errands told how often they had watched for the coming of the sun among the

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stars of Taurus till at last they were obliged to acknowledge the fact that the equinox had receded to the next constellation. In India and Persia the first of April is the beginning of the year, and the festival of the new year is celebrated with great magnificence. We have now reached a period of this cycle in which the vernal equinox is in Pisces, the autumnal in Virgo, the summer solstice in Gemini and the winter in Sagittarius. The Sphinx still calmly watches the passing years, and may read the world's history thus:

The Vernal Equinox is the time of hope, of renewed life. The sun is at that time in the constellation Pisces, a word meaning fish, multiplying, and from the same root as the word fish in that wonderful prophecy of Ezekiel, xlvii: 9—"Everything that moveth whithersoever the rivers shall come shall live, and there shall be a great multitude of fish." This is called the healing of the Dead Sea, and "two rivers" are said, in the margin, to flow into it. In the hemisphere of Dendara, Aquarius is passing two streams, the waters of life for the fish. Does the Sphinx read the mystery that the period has begun when many shall be restored to life by the blessings of these rivers? The prophetic vision reads: "Everything shall live whither the river cometh," and that the fish shall be "exceeding many."

The summer solstice, the longest day, is now in Gemini; the sign which I read as that of Benjamin and Joseph, the two sons of the beloved Rachel. The word Gemini—*twins*—may have been adopted from similarity of sound with the name Benjamin or Ben-jemini (1 Sam., ix, 1, margin). What story will the Sphinx tell us, if not that the day has begun for the blessing of the Son of righteousness upon the divided house of Israel. Some of the stars in Gemini tell of union. One, translated from the Coptic (Mazzaroth) means "the station of the wayfaring men;" another means "the coming." Will not this age see the return of the "wayfarers," Israel's wanderers? They have the longest day, and it is *now*. The autumnal equinox is in Virgo. The humiliation is nearly over. Christ's mediatorial work is drawing to the end.

The winter solstice is in Sagittarius. This is the shortest

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day, for the work of the archer is done—the dragon is wounded, we need no long day to tell that story. The explanatory decana of that constellation tell of the wounding in Draco; of the finished work in Arai; of the coming triumph in the Eagh and Lyra, for its brightest star, *Vega* (destined sometime to be the pole star) reads: "He shall be exalted."

Month after month of this passing year the Sphinx watches. The letters of golden light write the revelation. Have we not failed to note the correspondence of the star-written story with the revelation of the *Book?* Shall the Sphinx only, in his long rest, have time to understand how "the heavens declare the glory of God, and the firmament showeth His handiwork?" When Kepler established his third law he exclaimed: "God has waited six thousand years for an observer."

Let the Sphinx teach us a lesson; it is the same the Master taught—*watch.*

E. Bedell Benjamin.

WHAT SHALL BE THE UNIT OF MEASURE?

AN EARTH-COMMENSURABLE UNIT BEYOND THE REACH OF HUMAN SKILL.

The methods of geodesy, or earth measuring, in their present advanced state are a marvel of human attainment in making and using instruments of precision, in eliminating errors of observation, and in determining the form and size of the earth. The measuring of angles to the small fraction of a second, and of lines many miles long to within one-millionth of their length, the ascertaining of latitude and longitude to the nicety of inches, and the running of levels across mountains and through them, the tunnels being worked from both ends and meeting accurately in the middle, and even the measuring of the earth's polar diameter within a probable error of a thousand feet,—these are a few of the modern achievements in geodesy.

But every advance in skill and science has been the means

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of detecting new difficulties to be overcome before we can determine the precise form and size of the earth. Formerly the earth was believed to be a sphere, and its form certainly is so nearly spherical that its shadow seen upon the moon during an eclipse appears to our eyes to be perfectly circular. Later, the pendulum was found to beat slightly faster in high latitudes than in low, and this, with other indications, led to the conclusion that the earth is not exactly a sphere, but is spheroidal. Then many arcs of meridian were very carefully measured, and discrepancies were found in the results which could only be explained by admitting the earth to be ellipsoidal; that is, it is not only compressed from a circular form in its polar section, but also, in a less degree, in its equatorial section. Now, the ellipsoid is suspected to be slightly ovaloidal, the large end of the egg being at the south pole; but if ovaloidal, the forces which are believed to have produced this form are still at work, and are slowly changing with the precessional period, so that by and by the small end of the egg may become the large end.

Then again, close observations, many times repeated, and the most delicate experiments have combined to lead to the conclusion that the earth is not evenly balanced, nor strictly elliptical in either its polar or equatorial section, and its form is now described as *geoidal*,—that is, earth shape. (Scientists have the fashion of saying: "I do not know," in Greek;—it is easier to make confession in an unknown tongue.)

Before this geoidal shape can be formulated, we must be able to calculate the effects of volcanic and other plutonic forces which, within historic times, have very sensibly changed the topography of large areas of the earth's surface. The isthmus of Suez, for illustration, has been tilted so that the Mediterranean sea has encroached upon its northern side, ruining some of the old towns there; while, on the other hand, what is now the southern shore of the isthmus was once covered by the waters of the Red sea. The coast of Chili is several feet higher above the ocean level than at the commencement of this century; the coast of Greenland is settling. We might add almost indefinitely to the known list of chang-

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ing levels, some of them extending over vast areas; but, very probably, the changes which we do not detect may far exceed those which have been observed.

If we may accept the opinion of most geologists, the earth was once a molten mass, which has been cooling and solidifying for thousands of ages, and still continues the process, causing constant shrinkage and warping of the crust. In the former molten state the earth was demonstrably spheroidal through the action of centrifugal and centripetal forces, though daily distorted by tides. But since that time, according to Mallet (see Encyc. Brit. article, Geology), the earth has shrunk, in cooling, not less than 189 miles of its diameter; and who can calculate the warpage since the earth's crust began to wrinkle into mountains, and hills, and valleys, and ocean beds; to bulge into elevated plains as in Central Asia, or to sink into vast depressions like the Great Desert of Africa? Perhaps areas, either of depression, or of elevation, may surround and include the poles of the earth. Perhaps the earth may now be gradually yet sensibly changing its polar diameter, by a changing of level like that observed on the coast of Greenland; or a more rapid change may come at any time, as on the coast of Chili; or if the earth gradually and slightly changes its axis, as astronomers suspect, that very movement, since the earth is not a sphere, would almost necessarily change the measure of the axis.

Then we may ask concerning winds and waves, sunshine and rain, electricity and chemical forces: who shall estimate the inconceivable power of these forces, or the measure of their effects upon the form of the earth?

In view of all these difficulties and disturbances, how can we expect ever precisely to determine the form and size of the earth? As Prof. Merriman, in 'Figure of the Earth,' says, "Years and centuries must roll away before sufficient data shall have accumulated to render a theoretical discussion satisfactory in its results." President Barnard, in the same despondent tone, says that the earth's polar axis is "unknown" —that is, it is not known to sufficient accuracy to be taken as a practical standard of linear measure.

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The great problem of geodesy remains unsolved, and is proved to be unsolvable. Hence an earth-commensurable unit of measure cannot now be, nor ever could have been devised by mere human skill. A unit adjusted to the much ridiculed standard of three barley corns in length, if that length has been successfully laid off on a suitable metal bar and is preserved as a standard of measure, is quite as dignified a standard as a platinum bar which tried to be—but everybody knows is not—the $\frac{1}{10000000}$ of the earth's quadrant of meridian.

A perfect cosmic unit of measure, if such ever existed, must have had divine origin, "For vain is the help of man."

A DIVINELY REVEALED UNIT OF MEASURE IS PROBABLE.

May we reasonably hope to find a record of a divinely given unit of measure?

We do not expect to receive by revelation any truth which lies within human grasp, but if we believe in revelation at all, we must believe that it makes known every fact essential for man to know, which otherwise would lie beyond his reach. The question of a revealed unit of measure may then be narrowed down to this: have we the record in the Bible of any commands imposed by God, at any time, upon any people, or individuals, which would necessitate their use of exact measures?

We find in the Bible three notable instances in which God gave commands which required work to be made of specified dimensions. The first of these commands was given to Noah: "Make thee an ark of gopher wood." . . . "And this is the fashion which thou shalt make it of: the length of the ark shall be three hundred cubits, the breadth of it sixty cubits, and the height of it thirty cubits," &c. . . . "Thus did Noah; according to all that God commanded him, so did he."—(Gen. 5th chapter).

The next notable instance recorded is that of Moses, with whom God "communed" upon Mount Sinai during the forty days and forty nights of that wonderful interview in which Moses was showed the pattern of the tabernacle which he was to build. And a little later, "Moses was admonished of God when he was about to make the tabernacle; for see, saith he,

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that thou make all things according to the pattern shewed to thee in the mount." . . . "According to all that the Lord commanded Moses, so the children of Israel made all the work. And Moses did look upon all the work, and behold, they had done it as the Lord had commanded, even so had they done it: and Moses blessed them."—(See Exodus, chapters 25 to 40).

Again, we read concerning the building of the temple: "Then David gave to Solomon, his son, the pattern of the porch and of the houses thereof." . . . [Then follow the details.] "And the pattern of all that he had by the Spirit." . . . "All this, said David, the Lord made me understand in writing by his hand upon me, even all the works of this pattern."—(1 Chron. xxviii, 12-20).

The ark was built by Noah according to directions and dimensions given to him by the Lord; the tabernacle and all its appointments were made by the Israelites, according "in all things" to the pattern which God gave in completeness of detail to Moses in the mount; the temple was built by Solomon, after the specifications which were revealed "in writing" to David, his father, "by the Spirit." In view of the explicitness of the plans and dimensions, and the strictness of the command to obey them, are we not almost compelled to infer that the unit of measure—the cubit—by which God gave the dimensions, was exactly defined in length, either by reference to one already established standard cubit, or by the revelation of a new standard? In either case its length must have been exactly communicated by God to Noah and Moses and David, or, which is equivalent, communicated directly to Noah and transmitted by him, through a fixed standard, to Moses and David.

In further confirmation of this theory we read that divers weights and measures were forbidden the Israelites, and they were enjoined, "Ye shall do no unrighteousness in judgment, in meteyard, in weight, or in measure. Just balances, just weights, a just ephah, and a just hin shall ye have."—(Lev. xix, 35-36). Now, all political experience teaches that a law enjoining just weights and measures would be a dead letter if there were no government standard of weights and measures; and we may be sure the Theocracy would not commit the blun-

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der to proclaim a law without providing the means for its fulfillment. Indeed, a Theocratic form of government, destitute of a standard of weight and measure, seems an absurdity.

But, happily, the Scriptures clearly prove that the standard cubit was preserved unchanged for centuries in the most holy place, first of the tabernacle and afterwards of the temple. For the Lord said to Moses in the mount: "And they shall make an ark of shittim wood; two cubits and a half shall be the length thereof, and a cubit and a half the breadth thereof, and a cubit and a half the height thereof. And thou shalt overlay it with pure gold, within and without shalt thou overlay it, and shalt make upon it a crown of gold around about."—(Ex. xxv, 10, and following). "And the work was made by Bezaleel, the son of Uri, of the tribe of Judah, whom the Lord had appointed and endowed with wisdom and skill for the work. "And Moses did look upon all the work, and behold, they had done it, as the Lord had commanded, even so had they done it."

This same ark was deposited, centuries after this, in Solomon's temple; as we read, "And the priests brought in the ark of the covenant of the Lord unto his place, to the oracle of the house, into the most holy place, even under the wings of the cherubim." "And there (say the Chronicles) it remains unto this day." (2 Chron. 5th chapter.)

The ark of the covenant, then, the workmanship of the divinely appointed Bezaleel, made according to all that the Lord commanded Moses, and deposited in a place so sacred that none but the High Priest dare enter; was, in its cubit dimensions, a fixed and permanent standard of Hebrew linear measure. We have sufficient proof, however, that the Israelites had in common use other measures which they derived from the nations around them; but the use of strange weights and measures was but characteristic of a people who were prone even to worship strange gods.

Since God gave the Israelites a standard of measure, which they deposited as he directed, and kept unchanged for centuries, only losing it at last through their disobedience, we have strong reason to believe that the once revealed dimension is still in some safe repository providentially saved for the use of re-

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stored Israel, though the Mosaic ark may have been destroyed. And since a divinely given standard unit would have permanent intrinsic value, superior to that of any other unit of measure, therefore, the cubit given to Noah was, without doubt, of the exact length of the cubit delivered to the Israelites; and Noah, or one of his sons saved with him in the ark, may have been inspired to perform the very work which would transmit the cubit of the ark, not only to Moses, but to the latest generation of men, just as Moses, by divine commission, transmitted the cubit of the ark of the covenant to David.

There is, then, strong probability that we may yet find a record of a divinely given unit of measure, which shall exactly restore to us the standard of Noah, and Moses, and David.

THE DEPOSITORY.

A standard measure of length cannot be preserved by a mere written description; the distance must be laid off on some durable and unchanging substance. Where, then, is a fit depository of that anciently revealed Noachian unit of measure,—some structure which dates back to the lifetime of Noah,*—exact in workmanship,—pure for divine use,—accessible to Moses,—and preserved to this day?

We claim that the Great Pyramid of Egypt is the only structure upon the face of the earth which fulfills all these conditions. It was for 170 years (Usher's chronology) cotemporary with Noah, who, we read, lived for 350 years after the flood; its workmanship is acknowledged to be exquisite; the idol temples of Egypt were closed during all the years in which it was building, and, though it is surrounded with marks of the grossest idolatry, it is itself free from taint; it stands in the birth-land of Moses, who, as heir apparent to the throne of Egypt, had access to it, and knew the measures by which it was built, for "Moses was learned in all the wisdom of the Egyptians;" and, though marred and disfiugred with age and violence, it yet retains enough of its original perfection to yield to us the secret of

* The lost ark of the covenant, if recovered, would not fill the gap between Noah and Moses; we must, therefore, seek a more ancient repository of measure than the Mosaic ark.

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its primeval weights and measures, and the proof, if any it possesses, of divine authority.

The theory of John Taylor, that the Great Pyramid is a divinely ordained depository of weights and measures, we must conclude, then, is very strongly supported by the prior argument of probability. Now, let the confirmation of that theory rest upon the testimony which we may obtain from the Pyramid itself.

A mass of evidence has been obtained from the Pyramid in late years confirmatory of its high scientific character, astronomical, geometrical, geographical and historical; but this article will discuss only a single line of these discoveries (the one most familiar to the writer) with the purpose of finding the unit of measure deposited there. And,

1. The most prominent characteristic of the Great Pyramid is the ratio of its height to its perimeter, which is as radius to the circumference of a circle. This chief prominence of the π ratio demonstrates that its supreme importance to science was understood by the architect.

2. The dimensions of the ante-chamber and king's chamber, as measured by Professor Smyth, the great advocate of the Taylor theory, and confirmed by W. M. F. Petrie, the most thorough and energetic opponent of this theory, repeat the declaration of the exterior of the Pyramid that π is supreme in mathematics, as may be seen by the following partial list of dimensions:

	British Inches.		
	Smyth.	Petrie.	π Formulæ.
Whole length of ante-chamber floor,	116.37	116.3	$\frac{648}{\pi\sqrt{\pi}} = 116.372457+$
Length of granite in floor of ante-chamber,	103.13	103.2	$\frac{324}{\pi} = 103.132403+$
Length of king's chamber,	412.54	412.56	$\frac{1296}{\pi} = 412.529612+$
Width of king's chamber,	206.26	206.35	$\frac{648}{\pi} = 206.264806+$
Height from floor (" 1st height"),	230.61	230.15	$\frac{324\sqrt{5}}{\pi} = 230.611064+$
Height from base of wall ("2d height")	235.58	235.26	$648 - \frac{1296}{\pi} = 235.470388-$
Total,	1304.50	1303.82	1304.380730±

Also, the exterior dimensions of the Pyramid, as formulated by

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their ratio to interior dimensions, and compared with Smyth and Petrie, are:

	Smyth's Estimate.	*Petrie's Measure.	π Formulæ	Value.
Height of Pyramid,	5818.+	$5818.6\pm$	$\frac{32400}{\pi\sqrt{\pi}}$	5818.622870+
Length of base side,	9140.	$9139.8\pm$	$\frac{16200}{\sqrt{\pi}}$	9139.871258l+

3. The integral numbers of the ante-chamber and king's chamber dimensions, when expressed in tenths of the king's chamber width, $\frac{648''}{10\,\pi} = 20.6''+$ (which is given in Haswell's and other tables as the value of the Memphis cubit), show that the builders of the Pyramid worked by this cubit. (See "The Proportions of the King's Chamber." By W. H. Searles, Vol. 1, No. 1, Magazine.)

4. Each side wall of the king's chamber, with its perimeter of 1296 inches, and its length diametral to the perimeter, or $\frac{1296}{\pi}$, represents, on a scale of $\frac{1}{1000}$, a circle whose circumference measures one British inch for each second of arc, and whose radius is 10,000 cubits, thus correlating the cubit and the inch by means of the 360° (=1296000″ circle) and π. (See "The Perimeter of the Side Walls of King's Chamber," p. 240, Vol. ii, Magazine.)

The prominence of π upon the exterior of the Pyramid is maintained in the interior chiefly by the British inch, which tells of an invisible circle surrounding every line.† Yet the cubit is the plainer revealer of the 3, 4 and 5 triangle,‡ and it interprets the π *ratios* of dimensions as perfectly as the inch, and hence puts itself in tacit dependence on π, and in harmony with the inch.

Two striking characteristics of the Pyramid must here be noted: first, the absence of a single full visible circle anywhere, either within or without; and second, the equally obvious pres-

*Calculated by the ordinary methods of trigonometry, from Petrie's data, assuming the *true* base of the Pyramid to be at the floor level of the S. E. socket.

† Notice that the average of π values is between the average of Smyth's measures and the average of Petrie's, as is proved by the footing up of the columns; showing that the π formulæ agree with Smyth and Petrie within the probable plus or minus error of each. (For a fuller list of π formulæ, and their geometrical relations to each other, see 'The Argument Condensed,' vol. 1, No. 1, of Magazine.)

‡ See the article by W. H. Searles, before referred to, "The Proportions of the King's Chamber," Vol. I, No. 1, Magazine.

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ence everywhere of the symbolized circle, both within and without; for every π formula or π ratio of dimensions, intimates a circle.

The duplex measures of the Pyramid, the cubit and the inch, correlated with the circle through π, form a perfect allegory of the Bible. The unseen yet recognized circle whose circumference is a line without end, represents the unspoken yet everywhere recognized name of Jehovah, the omnipresent and eternal God the Father. The π, by whose aid alone the circle is found in the Pyramid, and which is like the circle in its infinity (3.1415926535 + ... *ad infinitum*), symbolizes the Son of God.

How perfectly these symbols paraphrase the saying of our Saviour, "No man hath seen God at any time; the only begotten Son, which is in the bosom of the Father, he hath declared him."

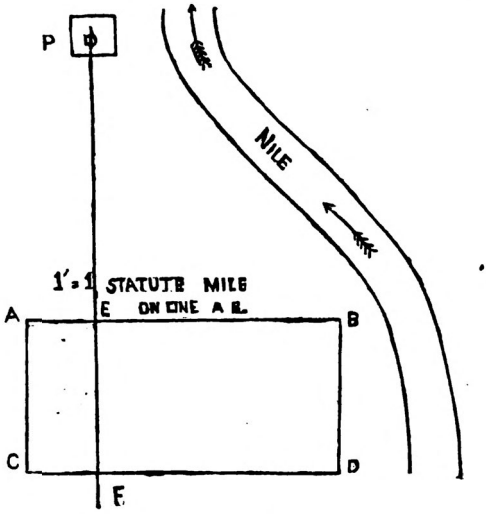
The cubit, which so plainly sets forth the right angled triangle, and the inch, which everywhere publishes π, are symbolical; the one symbolizes the Old Testament dispensation of law, by which every person's life was tested as with a try-square; the other symbolizes the New Testament dispensation of the gospel, which proclaims Christ to the whole world as our Mediator. As the old dispensation has been superseded by the new, so the cubit has given place to the inch; and just as the inch is chiefly instrumental in revealing the invisible circles of the Pyramid, so the Anglo-Saxon race, who have inherited the inch, are chiefly instrumental in the missionary work of spreading the knowledge of God, through Jesus Christ, in every nation.

THE CIRCLE OF THE EARTH WHENCE ANGLO-SAXON MEASURES MAY BE (WERE?) DERIVED.

The testimony of the Pyramid in favor of British measures is not yet exhausted. The 1296000 inch circle is typified on the side walls of the king's chamber on a scale of $\frac{1}{1000}$. If now we consider the whole Pyramid to be on the scale of $\frac{1}{1000}$ we may imagine its plan view to be enlarged 1,000 times, and a rectangle 1,000 times the size of the king's chamber floor to be laid off upon the land south of the Pyramid.

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The plot of the proposed survey would be somewhat like the diagram, in which the small square P represents the Pyramid, the dot in its centre marking the axis, and the small rectangle



within the square denoting the floor of the king's chamber. The site of the enlarged rectangle is shown at ABCD ; it lies wholly upon the west side of the Nile, which here runs in a northwesterly course until about opposite the Pyramid, where it bends to the north. (See atlas accompanying *Description de l' Egypte*, 26 vols. In Cleveland Public Library.) The meridian distance PE will measure 4¼ to 5¼ miles according to the position in which a test survey shall locate the axis of the Pyramid,* and the distance PF will be 7½ to 8½ miles. AB measures 412529 + inches = about 6½ miles, and AC, 206264 + inches = about 3¼ miles.

Now it is a fact, according to Prof. Stockwell, that the parallel of latitute in which the British statute mile equals one minute of longitude, lies from 5 to 8 miles south of the Pyramid. No one can calculate the exact location of that parallel from present data, for the reason, as shown in the first part of this paper,

*Prof. Smyth places the axis about in line with the overhanging top of the south wall of the grand gallery, and due north from the coffer, but Petrie locates it in line with the north edge of the great step.

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that no one knows the exact size or form of the earth. Our general knowledge of these is accurate enough to assure us in locating the parallel as somewhere between the north and south boundaries of the rectangle ABCD, and we cannot with entire certainty be much more definite than this. Yet, as we shall see, a special survey of that rectangle might determine almost exactly where it is crossed by the parallel of latitude whose arc between AC and BD measures one British mile to each minute.

The Pyramid here offers an exceedingly delicate test of the theoretical length of its inch, for its axis will yet be located with great precision. Probably the formula will be found which will determine its exact distance from the king's chamber. When that shall have been done, the rectangle ABCD may be laid off from the Pyramid within the tenth of an inch of its theoretical position, while the enormous variation of *three miles* would change the inch by only $\frac{1}{2000}$ of its length; for, to near approximation, cosine of latitude CD : cosine of latitude AB : : length of one minute of arc on CD : length of one minute of arc on AB : : .867331 : .866897 :: 1.0005 : 1 : : the inch derived from the parallel CD : the inch derived from the parallel AB.

The rectangle ABCD offers peculiar advantages for geodesic work. An instrument placed at C, for instance, and adjusted to the meridian, will sight an object on the line AB about 100 inches east of the point A, because of the convergence of meridians, and each inch at this distance of 206264 + inches from the instrument of observation will measure one second of azimuth. — May not the azimuth of a very small arc be read off more accurately from a distant base line than from the limb of the instrument?

If an instrument should be placed at A and sighted to C, it would point slightly east of south; if another instrument were placed at B and cited to D, it would point slightly west of south. Let instruments so adjusted be turned upwards, and each note the time of transit of the same equatorial star; the instrument at the eastern station, B, would note the transit slightly *after* the star had passed the meridian of B, but the

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instrument at the western station would note the transit slightly *before* the star would reach the meridian of A, so that the star would cross the line of each instrument almost simultaneously.—May not the principle of simultaneous transit, observed from a measured rectangle, suggest the most accurate method of measuring an arc of longitude?

The north side, AB, of this rectangle possesses such peculiar advantages for a base line for geodesic work, and coincides with such accuracy to the minute-mile ($1' = 1$ mile, or 5,280 feet) circle of latitude, that it may be taken to mark the circle of the earth whence Anglo-Saxon measures are derived. The modern British inch varies at most but very slightly from the $\frac{1}{63360}$ (the number of inches in the statute mile), of one minute of arc on the line AB, and it is possible that the overruling Providence which has guarded it for these 4,000 years may have guided modern legislation to an exact restoration of its primitive length.

The earth standard to which the unit of measure in the Great Pyramid thus appears to refer itself, if divinely ordered, is doubtless cosmical, but in what respect does not yet appear. But whatever the import, or whatever the intent of the Pyramid architect may have been, if the topography of the land indicated by the retangle ABCD is favorable for accurate survey (of which I am not sure), and the geological formation is suitable for permanent monumental work, then the parallel of latitude passing through the base-line, AB, within the limits of the arc AB, would be a perfectly feasible standard line of earth reference for our system of measures, whereas the use of quadrants of meridian of the earth, which differ in length, or the earth's polar diameter, which we cannot measure with sufficient accuracy, are entirely impracticable.

If our investigation were to stop here we should be led to decide that the cubit of Noah and Moses and David, the cubit of the two arks—the ark by which the human family was kept from extinction at the time of the flood and the Mosaic ark of the covenant—was the 20.6+ inches cubit by which the Pyramid was built. This seems to be the natural inference from our argument, and we might not be without the support

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of authority if we were to assume the Mosaic cubit to be 20.6 inches. Yet, such may not be the necessary conclusion, as is proved in a letter just received from Rev. H. G. Wood, in which he shows that other measures as well as the 20.6 cubit and the inch are correlated through π with the 1296000 second-inch circle. Perhaps the so called sacred cubit of about five times five inches may be among the correlatives, and superior to all others, and divine appointment may have made it commensurable with the earth's polar diameter at a specific date. But these things are not yet proved, and so, for the present at least, our inch is the safe, the satisfactory, the earth-referable, the pure unit of measure, the emblem of Christianity, and we ought to keep it until it shall have fulfilled its period and announced its successor. At some future time, however, we may correct the inch if we shall prove it to have deviated in the least from its primeval value.

J. H. Dow.

STRUCTURE OF THE BASE.

This article will bring our review of Mr. Petrie's recently published work ('Pyramids and Temples of Gizeh') to a termination. We propose in this article to generalize a little, and give a clear and candid statement of our own theory of the general form and structure of the base from our own data, as the result of our very extensive calculations and researches, and a thorough consideration of all that has been written by Prof. Piazzi Smyth, Vyse, French Expedition, and the recent work of Mr. W. F. Petrie, and Pyramid literature in general. In the previous papers of this review we have scrupulously kept to our work of reviewing Petrie, accepting and testing his data, and endeavoring to explain his facts, as set forth by himself, by giving them the most probable interpretation. And this motive has led us to put forth a number of theories, based on his own facts, of the structure of the Pyramid's base. In the following article we propose to set forth our own conception of the original base, untramelled by Petrie's theories or explanations,

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as the result of our long and unwearied researches on this theme. We have kept our mind open to everything that has been urged in favor of and against the so called Pyramid theories, and we have given due weight to all that has been said by friend and foe alike. We have not pinned our faith to anybody's teaching, but have done our own reading, thinking and investigating. Our researches have been conducted *de novo*, as if nothing had ever been done by anyone, and the theory we now propose to set forth is unbiased and free from every taint of prejudice.

Mr. Petrie opens out his exposition, on page 37, by citing the materials available for a discussion of the original size of the base of the Great Pyramid: (1) "The casing *in situ* upon the pavement, in the middle of each face; (2) the rock-cut sockets at each corner; (3) the levels of the pavement and sockets, and (4) the mean planes of the present core masonry." He then proceeds to notice that, "On reducing these observations to give the mean form of the core planes at the pavement level, it came out thus:

	Core Plane Sides.	Socket Sides.
N.	9002.3	9129.8
E.	8999.4	9130.8
S.	9001.7	9123.9
W.	9002.5	9119.2
Mean	9001.5	9125.9
Mean difference	1.0	4.4 "

Mr. Petrie comments on this result as follows: "Here, then, was another apparently unaccountable fact, namely, that the core masonry was far more accurate in its form than the socket square. It is, in fact, four times (4.4 times) as accurate in length, and eight times (20″ against 162″) as accurate in angle. This forced me to the conclusion that the socket lines cannot show the finished base of the Pyramid."

"The clue which explains all these difficulties is—that the socket corners vary from a true square in proportion to their depth below the pavement, the sockets nearer the centre being higher."

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"This means that the sockets were cut to receive the foot of the sloping face, which was continued right down to their floors, beneath the pavement. (See Plate XI.)"

"Hence the sockets only show the size of the Pyramid, where it was started from varying levels, which were all *under* the pavement; and its true base *upon* the pavement is therefore 26 or 30 inches inside the lines of the sockets."

We have given Mr. Petrie's theory in his own words; and it is the most synoptical and comprehensive statement of his whole theory, of the structure of the base, to be found in his work. It will be seen from this statement that the pivotal idea in this theory is the location of the sockets. Their varying levels are the result of the unevenness of the rocky floor or foundation. The socket corners, he says, do not give a true square, the sides from socket to socket being longer and shorter according as the sockets are nearer the centre. The sockets nearest the centre have the shortest diagonals and the shortest sides to their square. We think it cannot be disputed that almost every measurer of the Pyramid's socket distances has acknowledged this leading fact, that the distances from one socket corner to another are not all exactly alike, nor are any two distances exactly the same. A fair and candid statement of this leading fact is demanded from every one who undertakes to write upon this subject, or to set forth any theory of the structure of the base and the length of its sides.

The pivotal idea in any theory must be the location of the socket corners and their significance. Any explanation of the structure and size of the base would be worthless in the end, without a true theory of the location and significance of the sockets.

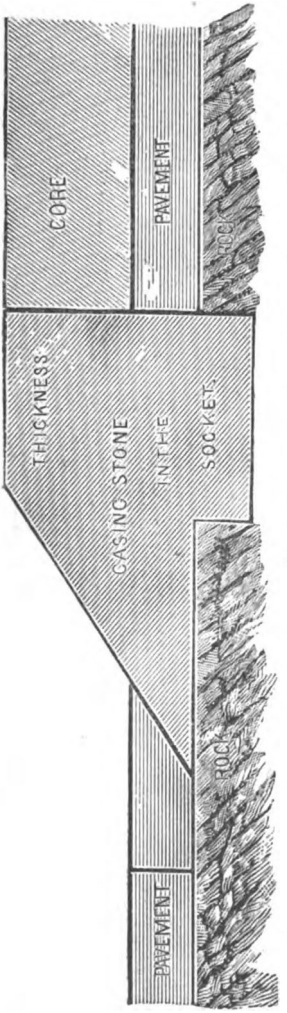
THEORY OF THE SOCKETS.

We begin, then, with a theory of the sockets. We say it candidly, but we say it modestly, that the common and popular theory of the sockets is erroneous and misleading. It has been the fruitful source of all the wrangling which has been indulged in by Pyramid measurers and writers since the days of Herodotus, but especially within the last half century, and more recently since the days of Taylor and Professor Smyth. Th

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popular theory is set forth in Mr. Petrie's statement given above, "that the sockets were cut to receive the *foot* of the sloping face, which was continued right down to their floors beneath the pavement."

Our theory is different. We consider the sockets were cut to receive the *heel—and the heel only*—of the sloping casing, and that the foot rested on the solid rock beneath the pavement, as shown in the following diagram.



In this theory the *heel* of the corner stone is in the socket, and the foot of the casing rests upon the same level floor as the pavement; whilst the backing of the casing is variable—thicker and thinner according to the situation of the stone in the alignment of the side. In the middle it would be a thicker backing than at the ends of each side, near the corners.

This theory is more architectural and consistent with the general theory of the structure and alignment of the sides. The corner stone of each angle must have a foothold and foundation in which it can rest, and resist any expansion of the diagonals and sides, and thereby firmly hold the sides and centre in their places. The corners of a building hold its sides together, and if the base had been built on the platform without the corner stones being imbeded in a socket, the sides would expand and slide out of place and position.

The prominent feature of this theory of the sockets is the extension of the foot and toe to any desired length, and the opportunity it gives to slide the socket backwards along the diagonal to any desirable distance, whether

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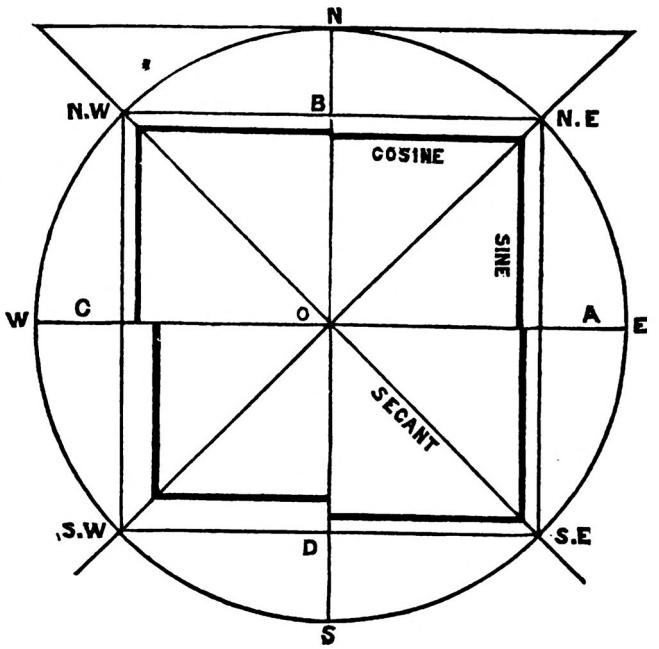
for convenience or for symbolic purposes. Hitherto the four shallow sockets have been regarded as the ancient outer corners of the base; whereas the theory we now suggest considers that the ancient and original casing *overlapped* the sockets, and that the ancient base is not defined by the sockets, nor do the sockets give any truthful idea of the actual alignment of the base sides which *overlapped* the sockets at each of the four corners of base. We believe that a closer examination of the sockets, and for some distance beyond them, will confirm every feature of this new theory of the sockets and their significance. We shall not attempt to enumerate the numerous proofs which have led us to this result. All we can do, at present, is to generalize a little, and condense our statement as much as possible.

In our previous papers we have spoken of a *geometrical* base, which was taken as a standard and guide, in distinction from the supposed actual builders' base, of the Pyramid as it was originally built. This geometrical base we have always spoken of as the model theoretical base=9139.8712581 British inches, with the formula: $\frac{180^2}{2\sqrt{\pi}} = \frac{16200}{\sqrt{\pi}} = 9139.8712581$. This geometrical base we now declare to have been the *actual original* base-length of the Pyramid, which the builders adopted as the *only real actual base*, as well as being its geometrical and standard base. We have introduced the following diagram in former articles embodying this conception, showing the relation of the core masonry to this base.

The *outer* square is the geometrical base of the Pyramid, which we regard as the *actual* square base of the Pyramid = 9139.8712 British inches to a side. If we estimate this geometrical base in time-factors of the equinoctial years—better known as the so-called Pyramid inches of Professor Piazzi Smyth—each side will be 9131.055 of these inches. And it is our firm and intelligent conviction that this is the only true theory of the Pyramid's base, and will be proven to be such by every competent exploration expedition that will be sent there in the future. Professor Piazzi Smyth's theory, when reduced to proper formulæ expressed in British inches, will outlive every other. The theory we now present assumes that the outer square is a

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true representation of the perfectly square base of the original,



with sides of equal length = 9139.8712 British inches. The original base was a perfect square.

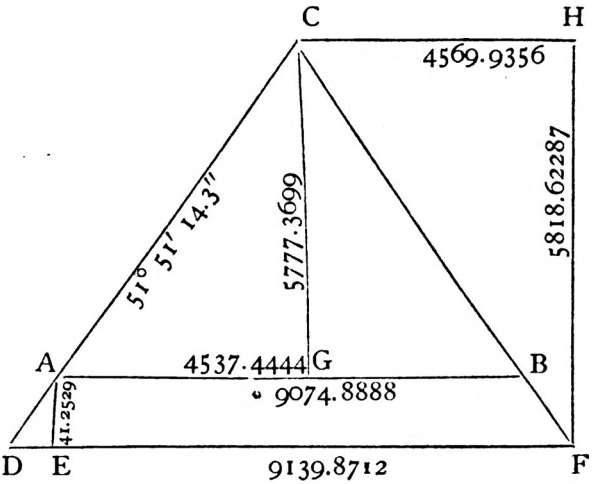
We now turn for illustration to Petrie's estimate of the core masonry and the thickness of the casing. We can only find space for a consideration of averages in this article. Speaking of the thickness of the casing, Petrie says: "If the angle on the south side were the same as on the north, the casing thickness would be 69.2 on the south. This, therefore, seems to make it more likely that the south side had about the same angle as the north."—p. 43. We, of course, do assume that the angles of the faces on the north and south were the same; therefore we should accept the thickness of casing so given, namely, 69.2 inches. This, of course, is an average. It is thicker in the middle than at the corners, where it is thinner. Now look at the result:

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N.	9002.3
E.	8999.4
S.	9001.7
W.	9002.5
Mean	9001.5
69.2 × 2=	138.4
	9139.9

Add the allowed thickness of casing, which is an *average*, to the *average* length of the core masonry, and the result gives the base side length we have given —9139.8712 British inches—the value of the geometrical base-side.

Now, let us try it in another way. We hold that both theory and fact require the *height of the pavement* to have a theoretical height of 41.2529 British inches, and that it is equal to the height of the basalt pavement in front of the eastern face of the Pyramid. Let us now calculate the length of the base of the Pyramid at this level.



AB, top of pavement,	9074.8888.
CG, vertical height,	5777.3699.
DF, lowest base,	9139.8712.
AE, height of pavement,	41.2529.
FH, total height,	5818.6228.
DE, thickness of casing,	64.9824.

Radius : 4537.4444 :: tangent 51° 51′ 14.3″ : 5777.3699 = CG. And by adding the height of platform we get 5777.3699 + 41.2529 = 5818.62287; whilst 5818.6228 × $\frac{\pi}{2}$ = 9139.8712,

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the base. Hence it follows that the true theoretical core length of sides must be 9074.8888 inches, instead of 9001.5 as given by Petrie; whilst the average thickness of the casing—taking thick and thin together—will be theoretically 64.9824 inches, instead of 69.2 as given by Petrie. 9139.8712—9074.8888 = 64.9824 inches.

The theoretical views presented in our former articles were all based on the acceptance of the common theory of the sockets, as being the actual corners of the original base, and on the supposition that the socket levels were the actual levels of the original base. We accepted the theory of the author of the book we were reviewing as a matter of duty, and gave the only probable solution from that standpoint. But it may now be seen that we do not accept the author's theory of the socket corners, nor the conclusions he draws from the premises. And we accept no other theory but the one herein set forth, namely, that the casing stones overlapped the socket corners, and that nothing but the heels of the corner stones were placed in the sockets. The sockets originally held the corner stones of the casing, but they only held the heel of the stones, the entire fore-front of the sloping part of the stones overlapped the socket, forming a step or foot resting upon solid rock at the same level as the pavement foundation. The sockets did not define the alignment of the original base by the exact amount overlapped by the fore-front and foot of the stones.

There are proofs of this overlapping whose significance has been overlooked. The Royal Engineers in their survey and measurements of the sides, in 1874, gave 9140 inches for the length of the south side base. And they did so because they measured the southwest corner at a spot where the casing had overlapped the socket by over 17.5 inches on the western side. Petrie noticed this fact in these words: "NOTE.—This south side is stated as 9140. Now the outer west edge of the socket-block at the southwest is 17.5 beyond the drawn line (which really defines the socket), and it is therefore about 9140 from the southeast corner; hence, this was probably taken as the corner, and 17.5 must therefore be deducted from the Royal

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Engineers, measure of this side in comparing it with other surveys."

In other words, when properly understood, the overlapping foot of the corner stone at the southwest corner was about 17.5 inches beyond the socket in which the heel of the stone was placed. But the western edge of the casing stone or socket-block had overlapped or stepped 17.5 inches beyond the socket so obviously that the marks of its overlapping were taken by the Royal Engineers as evidence of the actual position of the corner; and they measured from that spot, and found the side 9140 British inches. A closer measurement would have given our theoretic value 9139.87125 inches, or 9141.055 of Prof. Smyth's time factors, or equinoctial time inches.

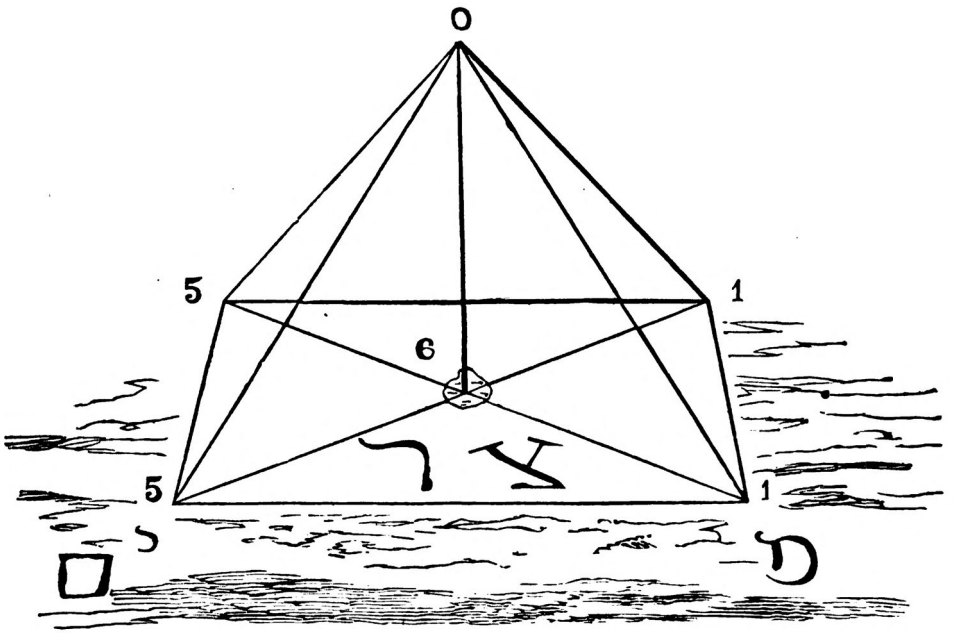
The original base of the Pyramid was a perfect square of 9139.87125 inches to a side; the geometrical base was its true base—its actual base—the builder's base, and the only base it ever had. The socket levels have been taken to indicate the actual length of the sides of the original base in some recent reviews of Petrie's book, our own articles included; but whilst we admitted the socket levels as data for computing the base sides, and tested their significance in the course of our duty as reviewer, yet we do not hold the socket levels to have the significance which Mr. Petrie has given to them; and therefore, the influences drawn therefrom are comparatively worthless, whether drawn by him or others. We predict that Prof. Piazzi Smyth will yet be vindicated and the Pyramid theory be triumphant; and the formulæ, which the leading members of the Institute have adopted and worked efficiently in their researches, will be accepted as the only reliable Pyramid formulæ as a guide to Pyramid measurements, and in exposition of its plan, design and structure.

S. BESWICK.

Strathroy, Ontario, Canada.

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A CRITICISM ON MR. PETRIE'S LATE PYRAMID MEASURES.



To test the value of Mr. Flinders Petrie's late work on the Great Pyramid, we, fortunately, have a common objective point in the measures of Colonel Howard Vyse, Piazzi Smyth and his own. Working from this, we can ascertain, to some extent, the true condition of some of his conclusions. We are, also, fortunate in having the carefully prepared chart of the Pyramid, issued by the Society. This chart is made up from the actual measures of various parties, especially those of Col. Vyse and Piazzi Smyth. In many respects their measures are in common, those of Col. Vyse having been verified by Prof. Smyth. Prof. Smyth pronounces the measures of Vyse, when tested for verification, "admirable" and "incom-

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parable." It is thought that this encomium should carry with it a degree of confidence in those measures not tested by Prof. Smyth, made and reported by Col. Vyse. There is justification in this, because, on examination of the measures of Mr. Petrie as to interior work, he quite closely follows the measures of Smyth and Vyse, with Smyth's angles; in fact, with such a plus and minus quantity attached as to bring such measures within the fair assumption that the measures of Vyse and Smyth can be taken as justified by him. As to the Society's chart, it has this great advantage, viz.: it has a discovered origin of the measures by which the construction of the Great Pyramid was made, the standard unit of measure, which was our "Imperial British inch," and the number of such inches going to make one of the cubits used in Pyramid construction, viz.: 20.62647 such inches. This number, as 206264 seconds, is the radius seconds of the circle of 360 degrees. The proof of this is to be found in the measures of the coffer of the ante-chamber, and of a number of prominent lines of measure; and this proof is set forth in 'The Formulæ' of Mr. Dow, published in the Proceedings of the Society. Part of the system of construction has been discovered to have been that the measures were, for the most part, designed to indicate diameters of circles, the circumferences of which were integral quantities; and from which, among other consequences, astronomical measuring data, are inferential.

Such being the status, then it was found that the reported measures of Vyse and Smyth, with others, could be used for reconstruction, enlisting in their use everywhere harmony and symmetry under such a system. This is displayed in this chart. Indeed, the work is so carefully done, and so faithfully, that the lines everywhere close with each other, the interior working co-ordinately with the exterior, and *vice-versa*, throughout; and this, let us repeat it, with the use of the actual measures and angles furnished. It has been conceded by those who have tested the work that such fitting and harmony, such symmetry and adaptation, could only come from the fact of the recovered use of the architectural design, and the measures actually intended and made use of.

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This is the material we possess for testing the work of Mr. Petrie; and, with this preamble, we will commence:

(1) With a discussion of the restoration by Mr. Petrie, of the descending passage way, or entrance passage. The data given us are: Mr. Petrie restores (1) the location of the passage and its dimensions by measures and angles; (2) he makes the connection of the passage with the mass, so as to give its relation to the exterior slope, and the vertical axial line, which he fastens as passing vertically through the peak, or gable ridge, of the queen's chamber; (3) because the 19th course of masonry is of a vertical thickness sufficient to admit the mouth of the entrance within that thickness, he postulates it that this is to be received as a *datum* of construction, and consequently works to this end as one of proper reference.

It is a happy thing for us that Mr. Petrie gives the height of the entrance passage, perpendicular to its incline, the same with that given by Prof. Smyth, viz: as 47.24 to 47.26 inches. Prof. Smyth computes this as 47.24 inches. The Society's chart gives it as 47.25419656 inches, deriving it from a π modulus, and from the origin of the Egyptian measures. This last, then, is our standard of reference to compare by.

Mr. Petrie gives the angle of the passage as 26° 29′ ± 1′, and 26° 27′ with a mean difference of 4′. Prof. Smyth gives a number of observations of this angle, taken by different modes, in which we find 26° 27′, 26° 27′ 58″, and 26° 28′ 16″. The angle found by the Society chart is 26° 28′ 24.10″, and this we take as our reference for a standard.

It will be seen that, so far, the variation from the reference standards adopted is so minute as to be practically *nil* in the distances to be affected by the reference.

This brings us to the measured dimensions of this passage way; (1) for its full length, and (2) for the distance from the mouth to the intersection of the first ascending passage way.

And as to this:

(*a*) Colonel Vyse, measuring from the outward edge of dilapidated roof of the passage, downward, gives the total length as 3850 inches. Mr. Petrie gives the same, practically, as 3856 inches, with, however, this statement of the measure:

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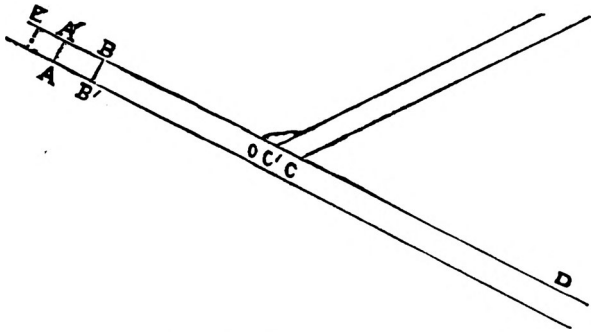
"3825 to 3856 inches," presenting a + or — of 31 inches to go on for exactitude. He adopts, however, 3856 inches, and on this makes the total length 4143 inches—"end of sloping roof 4137, Vyse, corrected for casing." Mr. Petrie does not pretend to exactitude in these, his actual measures, but as is seen is quite liberal. As to this he says: "For the total length of the entrance passage down to the subterranean rock cut part, only a rough measurement by the 140 inch poles was made, owing to the encumbered condition of it. The poles were laid on the rubbish over the floor, and where any great difference of position was required, the ends were plumbed one over the other, and the result is probably only true within two or three inches." This statement, with the somewhat enormous (for good measuring) limit of difference of 31 inches, can, it is thought, make us feel a greater confidence in the more carefully stated work of Colonel Vyse of 3850 inches. In other words: the giving of a greater and less than Vyse, with an admitted carelessness of measure, and a probable error of "two or three inches," which we must take as a reduction from his extreme maximum, or 3856 — 3 = 3853 inches, may make us feel, it is thought, an increased confidence in the measure of Col. Vyse.

(*b*) We now come to the connection of the entrance passage way with the exterior slope of the structure, which involves the ideal restoration of the dilapidated outside and its connection with the ascending passage way. This matter is of extreme importance, as by it Mr. Petrie places the whole interior passage and chamber work with reference to (1) the sloping outside, and (2) the vertical axial line of the Pyramid proper. He pronounces his work fit for future reference, as reliable, as worthy of taking precedence of all who have gone before him, the French, Col. Vyse, Prof. Smyth, and others; and here, certainly, we have one of the most important results of his work, and one which should be able to bear a tolerably severe scrutiny.

Prof. Smyth measured from the broken terminal end of passage way, from joint to joint, to the intersection of the ascending passage way, and in doing this so joined his work with that

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of Col. Vyse, that we are able to find a joint in common between them. Mr. Petrie follows these measures with the like result, so that we have a common objective point, or joint, for the three.



Col. Vyse commenced his measures from broken edge of roof at B, giving total length BD as 3850 inches. (The edge of the roof stone B is broken and uneven, and for a finish may have projected beyond its present face.) From B, he says, to the junction of the first ascending passage way (that is, to the "break out" at O,) is 758 inches. Prof. Smyth, measuring from A, or edge of basement sheet, gives AB′ as 162.3′ inches. Then from A′ (A′B being equal to AB′) to C′, that is, "from basement beginning to joint 18, situated up in a hole which is the continuation of the portcullis blocks" (or of the upper line of the ascending passage way,) "of first ascending passage way, and in their inclined line," 981.9 inches. C′ is at this point, or joint. Then from B to C′, by Mr. Smyth, is 981.9 — 162.3 = 819.6 inches. He gives the distance from O, or joint 17, to C′ as 60.0 to 60.3 inches; then from B to O is 819.6 — 60.2 = 759.4 inches. Take it so.

It is to be seen that the point O is at the "junction" of Vyse, or the "break out," and Col. Vyse says it is distant from B 758 inches. This seems to raise a common objective point of measure for these gentlemen, with a difference of 759.4 — 758 = 1.4 inches, which, perhaps, may be accounted for in their particular points of beginning to measure. It is from these data that, it is thought, the location of the point C can be recovered approximately.

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Col. Vyse gives BD — BO = 3850 — 758 = 3092 inches, as the distance OD. Take 2061.2 inches, plus its half, or 1030.6 inches, and we have 3091.8 inches. By Col. Vyse, 3092.0 inches. Difference $\frac{2}{10}$ of an inch. Therefore the distance OD seems to be 150 Turin cubits, for the Turin cubit is 20.612 inches.

Prof. Smyth gives OC′ as 60.2 inches, and C′C (measuring from the basement beginning, as "1022.2—963=59.2 inches") as 59.2 inches; or OC′+C′C=60.2+59.2=119.4 inches. Then CD would equal 3091.8—119.4=2972.4 inches, or 247.70 feet. By calculation Col. Vyse's measure of this would be 247.71 feet, or 2972.62 inches. On careful consideration this distance was taken as 247.752659 feet, or 2973.0319 inches, which might lessen OC′ or C′C by the amount of 1.2 inches; about the amount of the difference between Vyse and Smyth mentioned, viz., 1.4 inches (above). The reason why this slight increase was made, was because it was found, in the adjustment of lines and angles, to serve as a solution of position for many interpretations of measures. (1) By it the distance from the intersection of the floor line of the ascending passage way with the roof line of the descending passage way to the vertical axial line was found, in feet, to be the square root of 63360, which is 5280 feet, or our mile measure, multiplied by 12. (2) By it, on the geometrical determination of the length of the ascending passage way, this was found to be 123.68300698 feet, while by the extraordinarily carefully taken measures of this length by Prof. Smyth, he makes it 123.683 feet. (3) This measure so obtained was found to give a deductive time measure of a most magnificent character, viz., of the solar and lunar elements going to make up what is called the "Metonic Cycle." Indeed the authority in reconciling reconstruction, for this step was ample as justifying it.

Now reversing, or going back, we have, D to C=2973.0319 inches, then C to O=60.2+59.2=119.4 less, 6319 equal 118.7681 inches; or, 2973.0319+118.7681=3091.8 inches, and this plus the 758 inches of Vyse (or OB), equals 3091.8+758 =3849.8 inches. The common objective point is O, and from O to C′ is 60 to 60.3, say 60.2 less 6319 inches.

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Mr. Petrie gives, (1) From restored casing surface, on floor, to basement edge 124.2 inches. Then from edge of basement to joint 18, or C′, 1106.13—124.2=981.93 inches; which Prof. Smyth gives as 981.9 inches. To same point by Vyse, there is a minus of 1.4 inches, as stated. From this we have, practically, an agreement of measure for Vyse and Smyth and Petrie of the distance A′C′, the distance A′B being 162.3 inches. There is no dispute that C′ is the intersection of the roof line of the ascending passage way into the roof of the descending passage.

Col. Vyse makes the total restored length of the entrance passage "about 4126 inches." Because 200 Nilometer cubits are 20.62647×200=4125.294 inches, this is taken as the true measure on the Society chart. We have then for the length of restoration by Vyse, from edge of basement sheet to outer face of restored casing, 4125.294—3849.8=275.494 inches, less 162.3=113.194 inches. By this the total length of the descending passage way is 200 Nilometer cubits. From O to D 150 Turin cubits, and from O to E 200 N. cubits less 150 T. cubits.

Mr. Petrie gives the restoration as 124.2 inches. Difference 124.2 — 113.194 = 11.006 inches, as Petrie's excess over Vyse, for restoration. That is, Petrie makes the mass this much larger than Vyse. A slant rise of 11 inches indicates a base of about 10 inches, and for two sides of Pyramid this would indicate for Petrie's enlargement of base over Vyse's 10 × 2 = 20 inches.

By Vyse, or rather the Society chart, *D C*, as said, is 2973.-0319 inches, then from *C* (the intersection of the floor line of the ascending passage with the roof line of the descending passage) to E must be 4125.294 — 2973.0319 = 1152.2621 inches. The extension of the floor line for restoration is referred by a plane perpendicular to incline of passage, to the roof at E.

As seen, this is in practical agreement with Smyth's joint measures, and the location of the point *C′*, to within 1.5 inches.

NOTE.—Prof. Smyth finds a difference of something over an inch in the two lengths, on one or the other side, of the passage ways. By the Society chart the length of the descending passage way is 543.7745 + feet, and the base for this in-

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THE UNVEILING OF ISIS.

The object of the picture is to show the Divine origin of our Flag—the BANNER OF ISIS—and of the children of *Isis* or EVE, and the rise of the Gospel Kingdom or the Kingdom of the Son of Isis (Eve), that is, of Jesus of Nazareth—*Daniel* ii : 44.

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THE GOVERNMENT OF THE UNITED STATES IS ISRAEL RESTORED.—*Baldwin.* THE KINGDOM WHICH JESUS CHRIST CAME TO ESTABLISH ON EARTH IS THE UNITED STATES OF AMERICA.—*Jesse H. Jones.* SEE 'PROPHETIC VOICES CONCERNING AMERICA.'—*Charles Sumner.*

LEGEND.—The picture represents or portrays a period of Prophetical History from the year 1492 to the year 1881 and beyond—that is, from the triumph of the Cross over the Cresent under Isabella, Queen of Spain, to the surrender at Yorktown and the rise of the United States of America and beyond, or from the "creation or revelation of the new heavens and the new earth" to the fulfillment of the "sign of the coming of the Son of man in the heavens"

The sign or symbol in the heavens represents a woman or church clothed with civil power; her crown, "a new Constellation" upon earth, the fruit of her work with the Moslem power under her feet. The sign is also Astronomical, representing the Sun in the constellation of Virgo or Isis, the Virgin (month of September); her crown, the Corona Borealis; the Moon under her feet, as the hand of the clock, marking the day of the month or the hour of the consummation of the symbol, after the flight of the woman or church to the wilderness on the wings of an eagle, namely 1st, the 7th O. S. or 17th N. S. of September, 1643, the rise of the United Colonies of New England at the time of the Puritan Revolution and the first struggle "for Christ's Crown and Covenant;" and 2d, the 7th-9th 17th of September, 1774, the rise of the United Colonies of America, the child of religious persecution, the sign or symbol of "a new constellation," *the Stars and Stripes*, "the Pillar of Fire"; marking the beginning of the second struggle "for Christ's Crown and Covenant."

As the principal angels or messengers of the woman or Church in bringing forward the new kingdom there stand three men, Christopher Columbus, Martin Luther, and George Washington, the personations of three saints—St. Christopher, St. Martin, and St. Michael; the impersonation also of three mythological characters, put forth as prophecies by our forefathers in Egypt—Serapis, Bacchus, and Hercules—typified by three birds, the Dove, the Swan, and the Eagle: 1st, the Messenger or Revealer of "the New Heaven and the New Earth;" 2d, the Angel of the Reformation; 3d, Michael, or the Godlike, the Conqueror of the Dragon. The periods of their work, 1492-1499, 7 years; 1510-1517, 7 years; 1774-1781, 7 years. Behind the first are seen the Three Ships, like Doves, in the port of the "Holy Saviour," San Salvador. Behind the second is the burning of Huss (the Goose), from whose ashes sprang Luther (the Swan). Behind the third is the surrender of Cornwallis at Yorktown.

NOTES.—Jan. 2, 1492, the silver cross, the grand standard of the Crusaders, was hoisted on the tower of Camares at the Alhambra, above the Crescent. Jan. 6, Day of the Epiphany, the feast of the Magi, Ferdinand and Isabella made their solemn entry into the Alhambra with great pomp.—*Spanish History.*

2. The Moon, the symbol of the Moors and other Mohammedan nations, and is used upon their banners.

3. Isabella (symbol)—The beautiful Isis—The worshipper of God—*The Church.* "By Isabella was accomplished the grand event of European policy, the expulsion of the Crescent; and through Isabella the most prodigious event of humanity, that which doubled its terrestrial domain." "It seems as if heaven had raised her for two purposes—the overthrow of the Crescent and the discovery of the NEW WORLD."—*Spanish History.* "Without reservation I declare that Nature has never produced, and that Providence has never crowned with a diadem, a woman who can compare to Isabella, the Catholic."—*Bishop R. S. de Arevalo.* "IN THE WORLDS OF OUR PLANETARY SYSTEM THE SUN NEVER CLOTHED OR ILLUMINED HER EQUAL."—*Cardinal Ximenes.* A woman, the Church—the English Church—clothed with the civil power, Elizabeth or the beautiful Isis, the antitype (symbol).

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4. "For behold I create a new heaven and a new earth," etc.—*Isa-iah*, the prophet of *Isis*, lxv: 17; Rev. xxi: 1. Discovery of *the New World, the land of Isis, Oct*, 12, 1492.

5. "And then shall appear the sign of the Son of Man in heaven."—*Matthew* xxiv:30.

6. "AND THERE APPEARED A GREAT WONDER IN HEAVEN, A WOMAN CLOTHED WITH THE SUN, AND THE MOON UNDER HER FEET, AND UPON HER HEAD A CROWN OF TWELVE STARS."—*Rev.* xii: 1. The sun represents the civil power clothing Isabella or Elizabeth; also clothing the Church; the crown represents the twelve colonies.

7. Virgo, or Isis, one of the twelve signs of the Zodiac, represented as a Virgin holding in her hand the first fruits of the harvest; also a Lotusflower, or a Maiaflower. The Lotus is sacred to Isis.

8. The Corona Borealis or Northern Crown, Isis Crown, or Ariadne's Crown (stars in circular form), a constellation in the heavens called the Virgin's Crown. The new constellation" Symbol of the United Colonies and States.

9. The woman fled into the wilderness * * on the wings of a great eagle."—*Rev.* xii: 6, 14. The symbol of a ship or ships in which the pilgrims fled. The Mayflower sights land Nov. 9th, Old Style, or 19th, New Style. It is the day that Isis finds Osiris. The compact in the Mayflower, Nov. 11th, O. S., 1620—Advent day, Luther's day, St. Martin's day, Bacchus' day—the fulfillment of the wonderful myth of Isis and Osiris born in a LOTUSFLOWER, ISISFLOWER, MAIAFLOWER, OR MAYFLOWER. "IN THE CABIN OF THE MAYFLOWER HUMANITY RECOVERED ITS RIGHTS." * * * "HERE WAS THE BIRTH OF POPULAR CONSTITUTIONAL LIBERTY."—*Bancroft.* The great expedition of those who fled with John Winthrop in many ships from persecution, had for its flag-ship the great ship, Eagle, changed to the name of a noble woman who sailed in her—*Bancroft.* John Winthrop was chief magistrate of the United Colonies of New England.

10. September 7th, O. S., September 17th, N. S., 1643. The Moon under the feet of Virgo. The Sun clothing Virgo.

11. Signing of Articles on Sept. 7th, O. S., 1643, on Trimountain, Shaumut, the place of living waters—Boston, THE BETHLEHEM OF THE NEW WORLD—house of the Sun, of obedience, of Ceres or Isis, and of Bread. "This confederation was the child, which grew into a youth, and now waxes toward manhood as the United States of America." —*Charles W. Elliott.* "According to my calculations there only remains one hundred and fifty years to the coming of Christ."—*Letters of Columbus.* "This was a time of great expectation; the colonies looked for the second coming of Christ."—*Bancroft.* The New England Confederation of 1643 was the *model* and prototype of the North American Confederacy of 1774."—*John Quincy Adams. Fulfilled on the present site of* OLD SOUTH CHURCH, BOSTON.

12. Passage of Covenant September 17, 1643. The signing of the Scotch Covenant by the House of Commons and Assembly of Divines, in St. Margaret's Church, London, September 25, 1643.—*Carlyle.* "Christ's Crown and Covenant," inscribed on the banners of the Covenanters.—*Scotch and English History.* Sept. 17, 1630—Foundation of Boston; Sept. 17, 1643—Rise of United Colonies of New England; Sept. 17, 1774—First Declaration of Independence by Congress; Sept. 17, 1796—Washington's Farewell Address; 1787—Adoption of Constitution.

13. September 7, 1774.—First prayer in first Congress. Reading of Lessons in Prayer-book for the seventh. Special prayer for Boston and Suffolk County Convention in assembly. Remarkable scene in Congress, September 9, 1774, 19 A. M.—Central day of the symbol or sign, the Sun clothing Virgo. The Northern Crown rising. The Moon at the feet of Virgo—*Astronomical Calculation.* September 9, 1774.—"*On the wisdom and on the exertions and on the fortitude of this important day is suspended the fate of the New World and of unborn millions.*"—*Joseph Warren*, in the Suffolk County Convention.—*Bancroft.* Passage of virtual declaration of independence. Answer to the Praye of the Nation in Congress assembled. September 17.—Anniversary of the rise of t

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United Colonies of New England, also of the founding of Boston—Presentation to Congress of Act of Suffolk County Convention by Paul Revere. Passage of Resolutions sustaining the Act. (First Act of Congress promulgated.) (Wonderful scene in Congress.)

14. Isaiah lxvi; 8. Sortes Biblicæ."—*Samuel Adams.* BIRTH OF LIBERTY FULFILLED SEPTEMBER 9, 1774, IN MILTON, MASS., IN HOUSE NOW STANDING. 15. *"A new constellation."* Act of Congress, June 14, 1777. 16. Exodus xiii: 21. The first banner made by Elizabeth Griscom, and afterwards by her daughter, Clarissa Claypole. 17. "Christ's Crown and Covenant," the watchword of 1643 and 1774. See Bancroft.

18. Christopher Columbus, bearing the Rod and Staff of Isis, upon which is the child of Isis, on the cross of Isis. St Christopher, or SERAPIS, the god of navigation, from Hispalis, or Tartessis, Tarshish, the Christ-bearer, a saint whose mission was to carry the Saviour across the water—the mysterious prophecy of the early and middle ages, of the one who was to come in person as the real Christ-bearer Dove. The colossal statues of the saint with the infant Jesus on his shoulders, crossing the waters, were numerous until the advent of Christopher Columbus, of whom St. Christopher was the patron saint and namesake.

19. Martin Luther, the second Elijah, from Eisleben, (the Life of Isis,) the Bacchus of the myths, the god of *Liberty*, not of *License*; holding the *Life*, the Book of Isis, LIBERTY. St. Martin, noted for his work of the destruction of Paganism. He went about throwing down altars, idols and images. He was especially noted for his benevolence and charity to the poor. He was the prophetic saint of Martin Luther—his patron and namesake. A goose is eaten on St. Martin's day. Luther was christened on St. Martin's day.

20. George Washington, of VIRGINIA, the land of *Isis* or Virgo, whose symbol is St. Michael or HERCULES and the dragon, the defender, the sword of Isis of the seed of Isis, bruising the serpent's head. St. Michael, the defender and saviour of the King's daughter, the Church, the patron saint of the Jews, the conqueror of the dragon, Michael —"like unto God, or Godlike," represented with shield and lance, the prototype of George Washington. Note following curious words of Rabbi Wise, of Cincinnati, to the Jews of America, 1860: "We need not look beyond the messiahship of George Washington."

22. The crest of Columbus, three doves (argent) in blue field, with words above, "Faith, Hope, and Charity." The bird or messenger of the Holy Spirit and Cross, and of *Isis*.

23. The crest of Luther, a swan. He was called "the swan of EISLEBEN, or of the Life of Isis,"—the trumpet bird—type of the prophet.—*Isaiah* xxvii: 13; lvii: 1. *Rev.* xi: 15.

24. The crest of Washington, an eagle, (the national bird,) indicative of the warrior, with shield, blue field, with three silver stars, and four stripes, alternate white and red, horizontal, the color of the symbol in the heavens—the Stars and Stripes.

21. It was the custom in the early and middle ages to portray persons having holy missions with birds' heads, their types, and they were painted with birds' heads. St. John was painted with an eagle's head. St. John the Eagle Prophet.

25. *"God made me the messenger of the 'new heaven and the new earth,' of which he spoke in the Apocalypse of St. John, after having spoken it by the mouth of Isaiah, and he showed me where to find it."—Letter of Columbus.*

26. *"I do believe that I am that great trumpet which prefaces and announces the coming of our Lord."—Words of Luther. Michelet.* Luther the angel of the Reformation. See Elliott and Barnes, and many other commentators. "And I saw another mighty angel come down from heaven, clothed with a cloud, and a rainbow was upon its head, and his face as it were the sun. * * * In his hand a little book open, * * * and when he had cried seven thunders uttered their voices, * * * * and he lifted up his hand to heaven and sware * * that there should be time no longer, or but a time."—*Rev.* x. A time, 360—364 years. Era of Reformation, October 31, 1517.

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27. Michael.—*Rev.* xii: 7, 8. Washington. "This is he who was raised up to be not the head of a party, but the father of his country.—*Bancroft.*

"FAME SPREAD HER WINGS AND WITH HER TRUMPETS BLEW—GREAT WASHINGTON IS NEAR! WHAT PRAISE HIS DUE?

WHAT TITLE SHALL HE HAVE? SHE PAUSED, AND SAID NOT ONE, HIS NAME ALONE STRIKES EVERY TITLE DEAD."—*Sam'l Haven, 1789.*

28. Discovery, 1492-1499, seven years. "In seven years I accomplished this work, by the Divine will."—*Columbus.* 29. From Luther's call to Rome to publication of Theses, 1510-1517, seven years.

30. From Washington's entrance to Continental Congress to the surrender of Yorktown, 1774-1781, seven years. Surrender of Yorktown, October 17th to 19th, 1781. 31. Isaiah lx: 8, 9.

32. The burning of John Huss. "Are you going to burn a goose (Huss); in one hundred years you will have a swan (Luther) you can neither roast nor boil."—*Huss' words at the stake.*

33. End of the war. "Servant of God, well done."—*Milton.*

"These are the living lights,
That from your bold, green heights,
Shall shine afar,
Till they who name the name
Of Freedom, toward the flame
Come, as the Magi came
Toward Bethlehem's Star."

—JNO. PIERPONT.

"O trembling faith, though dark the morn,
A heavenly torch is thine;
While feebler races melt away
And paler orbs decline,
Still shall the fiery pillar's ray
Along the pathway shine,
To light the chosen tribe that sought
This Western Palestine."

—OLIVER WENDELL HOLMES.

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cline is 307.727248 feet. If the distance from *C* to exterior was 1152.621, less .7 of an inch, or 1151.562 inches, then we would have this remarkable fact, viz., 307.727248 × 1151.562 =3543670548. or, numerically, the exact time measure of the synodic lunar year of 354.3670548 days! And this requires only a differentiation of $\frac{7}{10}$ of an inch, which is within the limits of Smyth's; which shows that this measure, for differentiation, is to be found in the breadth of the passage. The proportion is a natural one, lying in the comparative measures of the same diagram. It is as follows: 343.7745 : 307.727248 :: 1151.562 to the corresponding base of the small triangle; which, necessarily, would be 3543670548, or the year measure, divided by 343.7745, which, as radius minutes of 360 degrees, is 3437.745 minutes.

What makes this the more remarkable is this: The Society chart finds the length of the floor line of the ascending passage way to be 123.6830069 feet (Smyth 123.683). Differentiate this as 123.682684, by a difference of .0003 of a foot. The synodic lunar month has 29.5305879 days. Then, if the tropical solar year of 365.24224 days be divided by this, the quotient will be 123682684!

It is marvelous that two lines of two connecting passage ways should, when referred to their point of junction, show such exact relations as to *the same time period*, viz.: the synodic lunar month, used in one instance as a factor of the tropical solar year.

This is the more remarkable because, with the very ancients, the fundamental basis for astronomy was this synodic lunar month and year, and in the measure of 247.7526 feet, below this same point of intersection, is to be found the exact measure of the famous Metonic cycle, by means of the use of the elements of this cycle, as follows:

Two hundred and thirty-five lunar months of 29.5305879 (it is elsewhere taken as 29.530887) days, each amount to 6939.688 days. Nineteen tropical years of 365.24224 days each amount to 6939.602 days. The difference for this—the Metonic cycle —is .086 of a day. But taking the *lunar week year* of 364 days, then 991 weeks, of seven days each, amount to 6937 days,

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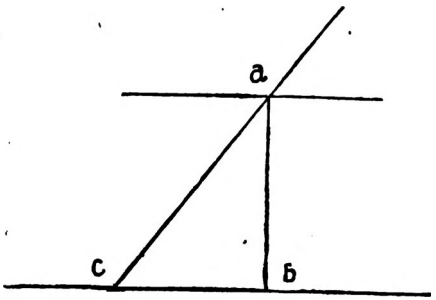
showing a difference from nineteen tropical years of 2.602 days. Now, 991 *weeks* are just 247.75 *months* of 28 days each, and this architectural Pyramid line measure is 247.7526 feet. Here, if we take the continued decimal figures 26, beyond the 247.75, to indicate the 2.6 days over of difference, then with this intercalation the periods agree to within .003 of a day in nineteen tropical years!

Now, all these measures of time periods, founded on the *synodic lunar month*, are thus found to radiate from one and *the same intersecting point* of these passage ways. For the basis of the small triangle we may have 307.727248 : 343.7745 :: 1031.32 : 1152.129, and 307.727248 : 3437745 :: 1030.6 : 1151.324; by which we see that the changes on its base for differentiation are closely connected with the cubit values in inches, viz.: 20612, the half of which is 10306, and 206264, the half of which is 103132 inches. These strange showings seem to point to the use of the diagonal joint across the floor of the descending passage way, so emphatically dwelt on by Professor Smyth.

To resume: Mr. Petrie, having "fixed the original position of the door-way of the Pyramid," gives a table of measures of the descending passage way, or entrance passage, p. 55; and, for *the connection of the ascending passage*, he measures to the intersection of the floor line of the ascending passage way with the floor line of the descending passage way.

To compare his work with Vyse's and Smyth's we will have, as a preliminary step, to refer his work and measures to the intersection of the floor line of the ascending passage way with the roof line of the descending passage way. For this we make the following diagram:

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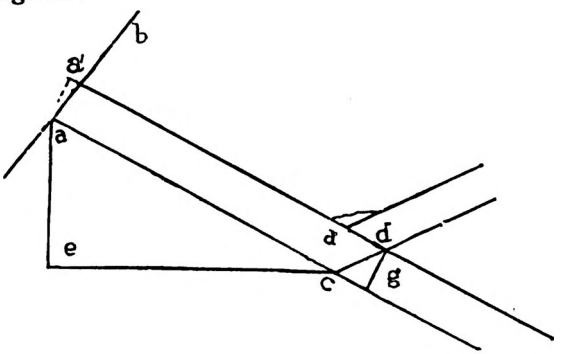


The point *c* is the intersection of the floors of the passages; *a* is the intersection of the floor line of the ascending passage with the roof line of the descending passage way; *ab* is perpendicular to the incline of the passage. The angle *b* is 90°; the angle *c* is 26° 28′ 24.10″ *plus* 26° 6′ 16″, or 52° 34′ 40.10″. Then the angle *a* is 37° 25′ 19.90″. The height *ab*, or side of the triangle, is 47.254 + inches. Then we have

Sin *c* 52° 34′ 40.10″ =	9.889918.
Sin *a* 37° 25′ 19.90″ =	9.783675.
Log. 47.254 = *ab*	1.674402.
Log. 36.15 = *bc*	1.558159.

So, to the distance down the passage to *c*, 36.15 inches are to be added to transfer the measures from *c*—the intersection of the floors—to the point *a*. By this *ac* becomes 59.5 inches. Professor Smyth calls it 60 inches.

With this preliminary step we can take up Mr. Petrie's measures of the descending passage way to the intersection of the ascending passage. He gives the following measures applying to this diagram:



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The point *c* is by Mr. Petrie in vertical height above the pavement, 172.9 inches. The point *a* is, for same, 668.2 inches. Then the vertical distance *ae* is 668.2—172.9=495.3 inches. With an angle of 26° 28′ 24.10″, on the Society chart, the vertical height has the proportion to the slant length of the descending passage way of 153.2476 to 343.7745 feet. From this, with the vertical height 495.3 inches, of *ae*, the slant length *ac* must be 1111.09 inches. To refer this to *d*, the length 36.15 inches will have to be added, making the distance *a′d* (equal to *ag*), to the intersection of the floor line of the ascending, with the roof line of the descending passage way, 1111.09+ 36.15=1147.24 inches, as the measure of Mr. Petrie. By the Society chart this distance as stated is 1152.262 inches. By Mr. Petrie, then, this measure is 5.022 inches shorter than by Vyse, while he has added, to complete casing, 11 inches in excess of Vyse. (In his tables of measures, Mr. Petrie gives the measures of length as follows: From finished casing to edge of basement sheet 124.2 inches, thence to intersection of floors of passages 986.44 inches; sum 1110.64 inches; which shows a difference from the above of .45 of an inch. Add 36.15 inches, to refer to *d*, and we have *a′d*=1146.79 inches).

While, therefore, the length of this passage to this intersection is closely the same, with these measurers, yet the difference of 5.022 inches is sensible. It must be accounted for in the effort to close the vertical axial line, passing through the peak of the queen's chamber, with the mouth of the passage being located in the 19th course of masonry. For as to actual measures Mr. Petrie agrees with Smyth and Vyse. He says, page 56: To joint 18 (Smyth) 1106.13 inches. Deduct from this 124.2 and we have 981.93 inches, from edge of basement sheet to joint 18, while Smyth's measure is 981.9 inches. And Mr. Petrie commenting, says: "It will be found that his (Smyth's) measures make the passage length about an inch shorter as an average;" which shows that Mr. Petrie considers his actual measures, practically, as agreeing with those of Mr. Smyth. And on this we may postulate a guiding working fact. When actual measures are given, Mr. Petrie's work must be judged by them.

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(*c*) Such being the status, then we have the following simple criticism on Mr. Petrie's work.

His length *a'd* is 1147.24 inches. Deduct 124.2, "restored casing," and we have 1023.04 inches. Smyth gives *dd'* as 59.2 inches to "joint 18." Deduct this and we have 963.84 inches, as the resulting and necessary distance, by Mr. Petrie, from edge of basement sheet to joint 18. By Vyse the length *a'd* is 1152.262 inches. Deduct 113.194 "restored casing," and we have 1039.068 inches for the same distance. Deduct 59.2 inches and there remain 979.868 inches for the same distance. Smyth gives this by actual measure, as 981.9 inches, and Petrie, by actual measure, as 981.93 inches. (The difference between 979.868 and Smyth's 981.9 or 2.032, may be corrected by making Vyse's restoration 111.162 in place of 113.194; correcting his 758 to 760.032 inches, Smyth's being 659.4 inches).

Compare Petrie's 981.93 with his necessary 963.84; the difference is 18.09 inches! By this the conclusion is inevitable that Mr. Petrie has forced a shortage of 18 inches, on the actual measure from edge of basement to joint 18, by suppositions and ideal distances. As this shortage must be corrected to the actual measures, then, necessarily the same shortage, or 18 inches, will have to be deducted from the ideal addition for restoration, because between the same limits. Deduct, therefore, this 18 inches from the 4143 (because by actual joint measures he agrees with Smyth and Vyse) inches, or his total length of passage, and there remain for this necessary correction 4125 inches; while by Vyse the passage length is "about 4126 inches," and by the Society chart, the same is 200 N. cubits or 4125.294 inches!!!

This result, however astounding, is the absolute outcome from Mr. Petrie's own data, and cannot be gainsaid. It follows from this that all he says as to the vertical axial line passing the apex of the queen's chamber has no foundation in fact from his own work. From what will hereafter be shown, quite similar to the above result, the solution of the matter seems to be this: Mr. Petrie seems to be following and confirming the measures of Col. Vyse, and, necessarily, those of the Society chart, to those who have the proper interpretation

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of his work, or who will give it a careful investigation, while to the casual or careless investigator he interposes these confusing and perplexing blinds of detail and surface results by statement and in terms of measures. This section of examination can pertinently be closed with the quotation *Ex uno disce omnes.*

(II.) Leaving this branch of his work, Mr. Petrie has introduced to, or rather has intruded on, the inquirers into the construction of this work two surprisingly novel features.

(*a*) He deliberately cuts down all former measures of the length of the base side by some 30 to 40 inches. (See chap. vi.)

(*b*) He has found that the lowest core masonry course (specializing the one on the north side) *curves from the outer corners inward toward the centre*, so that at the centre the distance from, and perpendicular to, the chord of the arc to the centre of the curve is some 37 inches.

Now it must be borne in mind that the casing stone, (or casing stones) found in place by Col. Vyse is nearly at the centre. So, if this novel feature is truly the case, then if the lower and outer edges of the casing stones were, for position, lined on the chord of the arc, and if at the centre the casing stone found by Vyse showed a flat top thickness of some 51 or more inches, this 51 inches would thin out, as the curves extended toward the corners, to be only some 14 inches. By which, if the length of the base side was estimated by the conditions of construction of this casing-stone, at the centre, *in place*, against the core masonry, then, indeed, the true length of the base would be much less than the one apparently indicated by the casing stone with its flat top of some 51 inches in thickness; the curvature inward from the corners having been left out of account.

The feature is a novel one, and, if true, justifies such a result, unless, as would most naturally be the case, the curve of the core course should practically be a templet, by following which with uniform casing stones, or nearly so, the finished polished outside of the casing would follow the curve of the templet, by which no such lessening in thickness would take place. In all probability this stated feature of curvature does not exist. It would hardly have escaped notice in the many

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careful examinations made of the base and core masonry. The rubbish heaps over almost the whole line of the base, with the corners of core broken away almost to the heaps, is quite a strong testimony and argument against the *ipse dixit* of Mr. Petrie.

But here, nevertheless, the assertion of this novel feature is a very important help, and in fact necessary to sustain the equally novel assertion of Mr. Petrie, viz: that all who have gone before him have erred materially, not only in their measures "between sockets," but also of "the present existing core masonry." So pat and necessary is this newly found curve, which no other Pyramid structure has, to the sustaining of Mr. Petrie's results as against all who have gone before him, that the assertion has all the appearance, at least, of a convenient invention to satisfy a theory calculated to mislead and confuse, as well as to silence criticism—in order that for the future Mr. Petrie's work may, on such statements of facts, be accepted as the standard guide in Pyramid studies. Mr. Petrie's statements may be true, and if true ought to be received. But Mr. Petrie's work, where trial can be made as to its accuracy, does not bear the test of careful examination; and this certainly tells badly in regard to his other assertions, especially where they seem to be so inconsistent with the recognized mode of Pyramid structure in Egypt. To this it should be added that the Royal Society have urgent and cogent reasons why the true measures of this Pyramid should not be commonly known, testified to by its treatment of Prof. Smyth, and by the actions of its various employés, among whom may be numbered the servants of the British government, notably Sir. Henry Somers, at the head of the Royal Engineers, with the subordinates of the Palestine Exploration, and, innocently enough, the wealthy and philanthropic Miss Coutts. These reasons are sound enough from their own peculiar standpoint, and as to them, where A, a very notable person, has a particular scientific knowledge of extraordinary value, it may be that, rightfully enough, he will endeavor to fudge, confuse, and mislead b, c, d, e, and many others of the smaller letters of the alphabet, who in their ill-timed researches threaten to make the grand discovery. Experi-

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ence of this sort of thing might lead one to ponder on the expression *Timeo Danaos et dona ferentes*, and even to fear that a Trojan horse might be being thrust into the apparently peaceful assembly of earnest inquirers, even though some were saying, "Yours faithfully." Proof that this sort of procedure is in vogue could be given. It is well enough even in a peaceful pursuit, when the object is a universal in place of a caste good, to be wise as well as industrious.

Mr. Petrie gives the length of "the present existing core masonry," on the north side, on page 38 of his work, as 9002.3 inches, and as calculated from his diagram, Plate X, as 9014.6 inches. This assertion is as astounding to those who have been in the habit of referring to the labors of the French savans under Napoleon, of Col. Vyse, and of others, as his assertion on which this one follows as a sequence, viz: "When reducing my observations (by triangulation, a mode suggested by the employés of the Royal Society, to insure success) after the first winter, I found that the casing on the north side lay about 30 inches inside the line joining the sockets." This is the fundamental *datum* on which all his work is based, and we have to accept it upon his mere say so, because he gives us no means of testing his work of triangulation. Triangulation is a high sounding term, but the detailed work of observations may, as any expert will admit, easily cover gross errors; especially likely in the hands of one who can so blunderingly err with the plain measures of the descending passage way. Mr. Petrie has given us no modes of test save that of seeing how his own results appear upon their merits. To do this, notwithstanding his assertions of the "ought to be" sufficiency of his statements, he has afforded us no other course to pursue than to test his results and statements even by those who have preceded him. Like Malaprop, they have gone before, and he *is preceding them* by a clean reach over.

In Mr. John Taylor's 'The Great Pyramid,' we have as follows: Mr. Nathaniel Davison was the British Consol at Algiers in 1763. He frequently visited, examined, explored and measured the Pyramid. "He found the side of the base (existing core masonry) of the Great Pyramid to contain 746 Eng-

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lish feet," or 8952 inches. "Davison's measure received, in 1798, a most satisfactory confirmation from the labors of the French *savans*. Having measured the apparent base of the Great Pyramid twice, viz:, from east to west and again from west to east, with a good measuring chain, receding for that purpose 100 feet toward the north, but still keeping on a line parallel with the base, M. Jomard found the length of the Pyramid from one visible angle to the other to be 745.8 feet, English," or 8949.6 inches. Again: "The dimensions of the Great Pyramid, according to Mr. Perring, the surveyor employed by Col. Howard Vyse, are as follows:" and among them "The present base 746 feet," or 8952 inches.

Against this core masonry, near the centre, Col. Vyse found a perfect casing stone in place. It had a flat top of about 51 inches to the beveled surface, in horizontal thickness. Mr. Petrie finds this same casing stone in place, and gives as its measures 62± 8 inches on top, and 108+ 8 inches on bottom, with height of 57.6 to 58.6 inches; and we may accept this measure because made for a special purpose of comparison. (Page 43.)

Col. Vyse made the former base with the casing stones 764 feet, the French 763.6 feet, and the survey under the Sultan 763.5 feet. The difference between 764 and 746 is 18 feet. This would show that the bottom thickness of casing stone was underestimated by Vyse, and really as Petrie gives it for correction, or else that the core masonry for the east and west termini of the north side was by Vyse found to be greater than he gives it. At any rate, these are the data we have to go on to test Mr. Petrie's work.

The difference of 8952 and 9003, or 9014 inches, or 51 or 62 inches, is too large not to attract especial attention, where the challenge is made against such parties as the French, Col. Vyse, and the engineers of the Sultan. It is too great for good surveying to admit of the conflicting measures being taken as of equal probable worth for obtaining a mean of measures. It is of so much importance that such a change on the former measures, especially by a single man, should make it incumbent on him to state accurately and systematically his mode

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and details of work by which the conflicting result was obtained. The failure to do this may of itself fairly raise a reasonable doubt as to the rightness of his results. Manifest errors in other parts of his work would but add to this right and reasonableness of doubt.

But the matter becomes of curiously emphasized interest when this difference of 51 or 62 inches is found to be, in the first instance the measure of the flat top of the casing by Col. Vyse, and in the second instance the measure of the same by Mr. Petrie himself. That is, $8952 + 51 = 9003$, and $8952 + 62 = 9014$ inches.

Still stranger and more remarkable if we take for use Mr. Petrie's measure of the bottom thickness of the casing stone, or 108 inches, as the correction of Col. Vyse's statement, which we have the right to do, as he expressly avers that this is the average measure of the Vyse casing stone. If we add twice this, or 216 to 8952, we have 9168 inches, or the base side length of Col. Vyse!! And this showing is nothing more nor less than marvelous when we take it into consideration with the similar condition of results found in the measures of the descending passage way, unless, indeed, we explain away the mystery by the simple discovery that Mr. Petrie, under cover of a confusion of statements to mislead, is really refinding, confirming, and correcting the results of Col. Vyse. The results are clearly here under our very eyes, and so plain that a running man may read them. In the first instance, his own work shows the measure of 4125 inches, Col. Vyse's being "about 4126" inches, and here, in the second, his own work shows a measure of 9168 inches, also that of Col. Vyse!

Indeed there seems to be no escape from these as right conclusions from the measures, save by the "hollowing" or inward curvature of the core masonry as alleged by Mr. Petrie, For 8952 is a much less measure than the 9003 of Mr. Petrie. and the casing thickness (which he corrects to 108 inches) of at least $99 \times 2 = 198$ inches, is admitedly set directly against this, making a base side length of at least 9150 inches, which is an excess of the measure of Mr. Petrie. The "hollowing," or inward curvature, would satisfactorily account for this otherwise

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insuperable error of statement by Mr. Petrie, provided he could show that the lowest outward edge of the casing was lined by the chord of the arc of curvature, which, however, he does not do; for the evidences do not exist, leaving the matter open to the statement of any desired opinion however far removed from the truth.

Mr. Petrie means necessarily to aver that the width of the core masonry at the centre, and at the Vyse casing stones, must be $9129.8 - 198 = 8931.8$, or else $9129.8 - 216 = 8913.8$ inches, which fact escaped the French, Col. Vyse, and all others who had preceded him, because of lack of observation of the "hollowing," or inward curvature, spoken of—which really makes the corner measures too thin.

As to this matter it seems to be but a fair presumption that had Mr. Petrie "reduced his observations" on the ground, and at the time of taking them, quite a natural use of his spare time, he would have found that he himself was the party in error. The difference was so great that it should have suggested, when found, a careful review and repetition of his work, which, however, he did not make. The importance of difference was so great, in view of its setting aside so much valuable and painstaking work of such distinguished men, that, in his own behalf, for modesty's sake and for the work's sake, it is natural to conclude Mr. Petrie would take the greatest pains to show clearly, plainly, and in satisfactory detail, the proof. He did no such thing, but to the contrary gives us a work vague in its statements everywhere; and reference is made to his work as a proof of this. He however places all investigators in the awkward position of trying to prove a negative. Any assertion of "You did" may be made, but it is very difficult if not impossible to prove that one didn't. Hence the care that Mr. Petrie should have taken, as a faithful and honorable searcher after the truth. It certainly is the truth that, on comparison, the labors of Col. Vyse and those of Prof. Smyth present an honest simplicity quite foreign to those of Mr. Petrie; and this is the more to be observed in view of the somewhat dictatorial terms in which Mr. Petrie sets aside as no longer of any authority the measures of these gentlemen.

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(III) The last matter to be noticed in this criticism, as to which Mr. Petrie presents novel and strange features of measures, is in reference to the vertical height of the upper and outward edge of the basement sheet above the base of the Pyramid. He gives the measure as 611.2 inches. The vertical height of restored lower lip of mouth of entrance passage, 668.2 inches, agreeing practically with his given level of base of the 19th course of masonry.

Col. Vyse gives height of edge of basement sheet as 588 inches above the base; and by the Society chart, with this and the length of the passage, with the angle of Smyth, viz., 26° 28′ 24.10″, the vertical height of outer and lower lip of mouth of passage is made to be 638.9 inches. How Col. Vyse found this the writer does not know, but judges it to have been by leveling from the base of casing stone, both objective points being in view, viz., base of casing and edge of basement sheet. It seems incredible that so great an error as 23.2 inches could be made by a competent and practical engineer in simple leveling for so small a height, with the termini in view, and in a field presenting few difficulties. The mode was simpler and better calculated to give a right result than by taking levels of masonry courses at corners three hundred and eighty feet distant, the intermediate space of courses being unknown for thickness because covered by rubbish. It would seem that, naturally, great pains would be taken to get this height accurately, as on it would depend the only mode for connecting the interior with the exterior. In this regard Mr. Petrie has introduced a new departure almost as startling as in the other instance mentioned, and because of the accumulation of such novelties, they appear as they accumulate, simply because they do so accumulate in his hands more and more incredible. There are too many of them, and appear Munchausen. His work is, by pronouncing these severe and many excesses of errors upon all his predecessors, subversive of all work done, former data being the guides; and the thought will rise that it is for the accomplishment of such a result, and to breed confusion, that his work has been set on foot, elaborated and published. Still his averments may be true, though probably false, and they must have the benefit

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of the doubt. His statements in this last special regard can only be pronounced upon after taking a new set of levels by parties competent and trustworthy. If the height of the edge of basement sheet is such in fact as that its extension could end in the 19th course of masonry, then, because the thickness of this course would admit the mouth of the passage, Mr. Petrie's reasoning as to this matter seems sound and good. In fact, in all the novelties he advances, this one has the most to commend it as being reasonable and probable.

J. RALSTON SKINNER.

May 8, 1884.

THE UNVEILING OF ISIS.

VI.

In order that my readers may clearly understand the meaning of my work, I have had engraved a copy of the picture embodying my thought, and publish therewith the notes attached so that they may have a synopsis of the whole subject for reference, whilst they have the detailed narrative of how I arrived at my conclusions.

As a whole, the picture represents the BIRTH OF LIBERTY. These three men, who stand in the foreground, are as the Magi who came to the birth of Jesus; they had seen his star or constellation in the east, and, being led by it, had come to worship him. These men, angels, or, in plain terms, messengers of the Most High, came to worship or assist at the birth of Christ's kingdom. The message to go and find the new world was given to the messenger of the new heaven and the new earth — the Christ-bearer dove — on the 6th day of January, 1492. This day is called in Spain the Feast of the Kings, or the Feast of the Magi. This day was at one time observed as the birthday of the Saviour. It was a fitting anniversary; and it was at this time that there might be seen streaming from the tower of Camares at the Alhambra the cross above the crescent.

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All Christendom rang with the news of the downfall of the crescent, and great celebrations and rejoicings were ordered by the Pope, and, curiously enough, at the same time came the expulsion of the Jews, as if Isabella, the great queen, had said: Go, seek your asylum in the new world, where my messengers have gone before to prepare a place for you. And then, when the St. George arose in the person of Cromwell, being at the very time when Columbus had said, "*by my calculations there remain but* 150 *years to the consummation of all things,*" the poor oppressed Jew sent a deputation to him, saying: Art thou our Messiah, or do we look for another? It was not until the third one of the group appeared upon the *scene,* MICHAEL, the God-like, that the representative Jew of the United States, said: "My brethren, *you need not look beyond the Messiahship of George Washington.*" The three men represent the north, the centre, the south — the Anglo-Saxon, the Teuton, the Latin and, strangely too, the types of all were alike; each one stands six feet, with eyes of blue, and chestnut hair. And, singular for Spain, Isabella, a woman of wondrous beauty, had auburn hair and blue eyes. Roselly de Lorgues describes Columbus as "tall, well formed, head large, aquiline nose, small, light-blue eyes—grayish; majestic presence and great dignity." Luther is described as tall, large—not portly, dark blue eyes, dark chestnut hair. Washington, tall and well formed, blue eyes—grayish, chestnut hair.

There is a curious combination of sevens concerning them. The word *Columba*, the true name in Italy, has seven letters; some historians spell the name of Luther as *Leuther*, in which case there are seven letters; and in the name of *Washing*ton, or Wessyngton, the *ton*, or town, is a suffix, and the meanings of the words seem to suit their vocations, taken with the birds which are their crests. Columba—dove—is a messenger, and the dove is a proper symbol for the work he had to perform and suitable to what he called himself, "I am the MESSENGER of the new heaven and the new earth," etc.; and again he says, in his memoirs, "*Seven years* was I accomplishing this object in accordance with the divine will," that is, from 1492 to 1499. And the word Leuther is FREEDOM, in other words, LIBERTY,

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and the swan his emblem. The black-billed American swan is the great trumpeting bird. Those who have ever heard the American male black-billed swan trumpet in the evening when startled or excited, can well appreciate the words of the poet, before quoted:

> But hark! What sound out of the dewy deep!
> How like a far-off bugle's shrillest note
> It sinks into the listening wilderness!
> A swan! I know him by the trumpet-tone
> Winging his airy way in the cool heavens,
> Piping his midnight melody he comes.
> Celestial bird! At this mysterious hour
> Why on the wing with chant so wild and shrill?

And why may we say that the swan represents Liberty?

Most of my best thoughts have come while in church, and meditating as I was almost constantly in leisure hours, or those not occupied in duty. In the little Episcopal Church at Meadville, in 1875, my eyes lit upon the dove in the stained glass window, then the thought flashed, Columba, dove—Christopher Columba—Christ-bearer dove—then looking up above there was a swan above the altar. My eye was constantly referring to the swan, and then I said, surely the Church must be symbolized by a swan; but when I asked some one who ought to know, he said, it is not a swan but a pelican, for the pelican sheds its blood for its young. Whatever, thought I, might have been the design, there is a swan—and again, in Trinity Church, Cleveland, there was the *swan*, perfect; and being with a friend there once, he said, "Did you see the swan above the altar?" "I did," said I, "and wanted to ask you if you did not agree that it is a swan and not a pelican."

Some time after that I came across that marvelous work "Luther's Table Talk," and there under the word "Swan" were Luther's words:

"I don't know a more exact image of the Church. The Church rests upon strong feet, so that the power of hell may not overthrow her. She is surrounded by lakes and marshes, that is, she aspires not to earthly dominion. She attacks not tyrants, but she repels their assaults by means of her two powerful wings—the ministry of the Word—and fervent prayer. Finally the swan sings at the approach of death; so the Church,

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when one of her members comes to his last moment, sings to him the glad notes of the Son of God."

What represents the Church but *Liber*, Freedom, *Liber the Book*, Liber the Tree of Life.

Beware, then, you who attempt to pull down the Temple of LIBERTY and tear from it the Free Book planted in our schools, for God will surely smite you with a curse if you remove this candlestick out of its place.

Seven years was the work of Luther until the grand act of his life, on the 31st of October, 1517,—that is, from the time he went from the shore of the Mediterranean to Rome, 1510—seven years.

But not only have we the dove and the swan, but the eagle in these churches. Here we have these three birds, and these alone in the church and above the altar. Why? These are the demi-urgic birds which brooded upon the water of chaos, symbols of the Godhead. And the third of these, MAGI, he who has the eagle for his emblem—this name signifies *high, keen, lofty*.

"She (who? FREEDOM) called her eagle bearer down,
And gave unto his mighty hand
The symbol of her chosen land."

THE EAGLE.—"*Percival.*"

"Bird of the broad and sweeping wing,
Thy home is high in heaven,
Where the wide storms their banners fling,
And the tempest-clouds are driven.
Thy throne is on the mountain top;
Thy fields, the boundless air;
And hoary peaks, that proudly prop
The skies, thy dwellings are.

"Thou art perched aloft on the beetling crag,
And the waves are white below;
And on with a haste that cannot lag,
They rush in an endless flow.
Again thou hast plumed thy wing for flight,
To lands beyond the sea,
And away, like a *spirit wreathed in light*,
Thou hurriest wild and free.

Lord of the boundless realm of air,
In thy imperial name
The hearts of the bold and ardent dare
The dangerous path of fame.

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Beneath the shade of thy golden wings,
The Roman legions bore,
From the river of Egypt's cloudy springs,
Their pride to the polar shore.*

For thee they fought, for thee they fell,
And their oath on thee was laid ;
To thee the clarions raised their swell,
And the dying warrior prayed.
Thou wert through an age of death and fears,
The image of pride and power,
Till the gathered rage of a thousand years
Burst forth in one awful hour.†

And then a deluge of wrath it came,
And the nations shook with dread;
And it swept the earth, till its fields were flame,
And filled with the mighty dead.
Kings were rolled in the wasteful flood
With the low and crouching slave ;
And together lay in a shroud of blood,
The coward and the brave.

And where was then thy fearless flight?
O'er the dark and mysterious sea—
To the land that caught the setting light,
The *Cradle of Liberty.*
There on thy silent and lonely shore
For ages I watched alone,
And the world, in its darkness, asked no more
Where the glorious bird had flown.

But then came a bold and hardy few,
And they breasted the unknown wave ;
I saw from far the wandering crew,
And I knew they were high and brave.
I wheeled around the welcome bark,
As it sought the desolate shore,
And up to heaven, like a joyous lark,
My quivering pinions bore.

And now that bold and hardy few
Are a nation wide and strong ;
And danger and doubt I have led them through,
And they worship me in song.
And o'er their bright and glancing arms,
On field and lake and sea,
With an eye that fires, and a spell that charms,
I guide them to victory !"

* The Roman standard was the image of an eagle. The soldiers swore by it, and the loss was considered a disgrace.

† Alluding to the destruction of Rome by the northern barbarians.

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It is said that the flag was fashioned from the colors of his coat-of-arms upon his signet-ring. Certainly is it true that the colors he bore gave rise to the Star Spangled Banner, and by their mysterious link in the chain prove him to be he who should come "MICHAEL" to defend the *woman*, the Church representing freedom symbolized by the *swan*, for the same colors are seen in the figure above his head in the Apocalyptic Vision.

Seven years was his work from the time he knelt in the first Congress in prayer to God, September 7, 1774, until September, 1781, when he knelt in that Gethsemane of the revolution at Yorktown. He stands as the conqueror of the dragon, the true personality of Him who was to come—written in the heavens, spoken of by the Prophets—and here in the vision represented. He stands with Columbus and Luther as the coadjutors and predecessors in the grand consummation, as a duplicate of the transfiguration on the Mount.

These are the living lights
That from your bold, green heights
Shall shine afar,
Till they who name the name
Of Freedom, toward the flame
Come, as the Magi came,
Toward Bethlehem's star.

In the heavens, LIBERTY, clothed with her garments of red, white and blue—the doors of the New World opened henceforth for the oppressed of all lands—and crying:

"LIFT UP YOUR HEADS, OH, YE GATES, AND BE YE LIFTED UP YE EVERLASTING DOORS, AND THE KING OF GLORY SHALL COME IN."

For now is set up that kingdom which Jesus the Christ came to establish upon the earth.

One day I received a letter from Jesse Jones, a Congregational minister, of New England, one of the greatest, though unrecognized, thinkers of the day, through Mr. Bisbee, our secretary, which said, that remarkable picture of "The Unveiling of Isis" is before me. If Mr. Latimer would like to know how closely we have thought together, I will send him a copy of my

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book, "The Kingdom of Heaven,"* and let him get Charles Sumner's '*Prophetic Voices Concerning America.*'—I procured the books and found the contents of page 215, of Jesse Jones' book, written in 1871, as follows, these words covering the whole page, in order to emphasize as completely as possible this thought:

"THE UNITED STATES OF AMERICA IS THE KINGDOM OF HEAVEN, WHICH JESUS CHRIST CAME TO ESTABLISH UPON THE EARTH."

He says: "The History of the world from this time forth is to be the history of the Americanization (*I would say Anglo-Saxonizing*) of all its peoples, which is the same as to say the Christianizing of mankind. This does not mean the absorption of all other nations into the American nation, for such will not be the case. It means that each nation retaining its own autonomy will adopt the American ideas and system of government, and every nation on the globe will be Republican. Then cometh the culmination, then will be formed the supreme and sublime coalition, the union of all nations under one administration—THE UNITED STATES OF THE WORLD, and its capital will be Jerusalem. Then will Jesus Christ come again, ascend his throne on Mount Zion, and sway the sceptre of universal dominion over a united race of loyal subjects. * * * We have found that every considerable characteristic of that kingdom is either actually or germinally present in the United States of America. We have found that all the great organic ideas of the Kingdom, those fundamental principles which determine the form of structure, bear the same relation to that nation. We have found also, that many of those details and results which the Bible gives as characteristic of the Kingdom are equally characteristic of it. Furthermore, the whole direction of its movement is evidently in a right line towards the complete realization of all that was ever foretold concerning the Kingdom.

This series of facts is wonderful, is startling, indeed, in its suggestive significance. Finally, it appears that there is no

* NOTE. 'The Kingdom of Heaven, What it is, Where it is, and the Duty of American Christians concerning it.' (For sale by Noyes, Holmes & Co., 117 Washington Street, and 9 Cornhill, Boston, Massachussetts.)

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similar nation on the globe, nor has been since the Christian Era, except in so far as some feeble copies of this have been attempted. In short, the Kingdom of Heaven has been the real idea of the United States of America from the beginning until this day, however unconscious its own citizens or the rest of mankind may have been of the fact. Its governmental structure has been, and is, so far as it has gone, the incarnation of that ideal. Its history has been the history of a steady advance towards perfectness of realization by incorporating one after another, the fundamental law, and the constitution, into its conduct of affairs. * * *

The trials which were foretold of the kingdom by the Prophets and by Jesus Christ are the supreme facts which it presents, and which have shaped the forms of its organism and determined the evolution of its history. Evil has been mingled with its good throughout, as was inevitable in the midst of such a race as mankind; but the good has faced the evil repeatedly, and has finally conquered. Our late war and its results are the culmination of all our past, and the prophecy of all our future. Other struggles are to come, but the end will always be the same. With steady flow and irresistible sweep our nation is to move forward on its present line of progress, thrusting out from itself one evil after another, and incorporating into its organic law one principle of the Kingdom after another, until, at last, it becomes the complete, harmonious, symmetrical, perfect embodiment of them all.

The facts that I have thus epitomized have never belonged to any other nation of men, and they seem to all converge to a conclusion fitted to thrill the heart, overwhelm the imagination, and conquer, with irresistible conviction, the intellect of every Christian citizen. In the utterance of this sublime fact all my labor culminates, and I hasten to its accomplishment.

CHARLES LATIMER.

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THE METRIC SYSTEM.*

MR. EDITOR:—A pouring rain that prevents sight-seeing, and almost hides the towers of Wartburg Castle on the hill opposite gives me a chance to say a few words about an article recently published, which says that the Librarian of the Paris Geographical Society has prepared a table showing what countries have adopted the French metric system and have made its use obligatory. The total population of these countries is given, and it professes to show that the people who use this system are vastly more numerous than those who do not, and among the minority are mentioned Great Britain and the United States. Thus those using the system aggregate, say, 241,972-011, as against 97,639,825 not using it.

I notice among those countries where this system is said to be in compulsory use, Norway, Sweden and Denmark. Now, I have just visited these three kingdoms, and while there I made it my business, as I have done in other countries, to make a full inquiry into the practical operation of the French metric system. I find that the Governments of the three countries above mentioned have adopted the system, and have appointed a date a few years in the future when its use will be obligatory, but as yei it is not in general use except among the employés of the Government or in Government depots. The people at large know little or nothing about the subject, and small progress has been made towards preparing them for the change. In the railroad stations may be seen charts hanging on the walls that give the system in a graphical way, and the weight of the luggage upon which an extra charge is made is computed in kilos, not in pounds; while everything weighed in the shops or markets is reckoned in pounds or measured by a "yard-stick," which is twenty-five of our inches in length; this I give from actual measurement—although the shopkeepers say that the Swedish measure for cloth is two-thirds of the English yard.

* From the Philadelphia *Ledger*.

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In Denmark so little is known about the enforced adoption of the French system that an important shopkeeper told me that it was never to be adopted.

What I wish to make clear to the readers of the *Ledger* is that the mere fact that the inhabitants of the countries using the metric system are more numerous than those of the countries which do not use it does not furnish so strong an argument in favor of the enforced adoption of this system as would at first appear. The interests involved and the industries which would be affected by the change must be considered. The uprooting of any established system of weights and measures is a matter of very serious import, aside from any question of the relative merits or demerits of the adopted or abandoned systems, and this is especially true of manufacturing countries where vast and varied processes depend upon established standards. It is not an exaggeration to assert that the confusion and loss caused by a change in the system of measurement in Russia, with her millions of peasantry, would be less than that sustained in the city of Philadelphia alone from a like cause. England and America combined control the majority of the commerce of the world. England and America combined lead the engineering output of the world.

To the merchant who buys and sells, it makes no matter if the yard is one of 25, or 36 or 39.39 inches long, nor if the pound weighs more or less than a pint of water; but to the engineer the matter is of more vital importance.

I have gone this summer through the workshops of almost all the great countries on this side of the water and in those of Germany. I have seen the practical use of the system that I have for so long a time condemned. I frequently asked engineers if they like the system and if they use it, and I will give the answer of one in Berlin: "We use it because we have to, and it is better to have some uniform system than the many measurements that formerly prevailed in the German States. The unit of the machine shop is the millimetre in everything except bolts, nuts and screws. All bolts and nuts are made to the English inch, because we use the Whitworth system. We

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do not like the metric system because it has too small a unit and the metre is too large and involves the use of decimals."

In Philadelphia the firm of William Sellers & Co. adopted the French metric system in an important part of their works as long ago as thirty years, and have continued its use since, until their workmen are as familiar with it as with the inch. With all this long practice during my connection with the firm, I have written and spoken against the enforced adoption of the system, not only because of the expense involved in changing, but because it is not a practical system; it permits of no elastic gradation of shop or trade sizes. The millimetre is taken as the standard to avoid the complication of the constant use of decimals, as nearly all measurements in machine work are less than one metre. This small measure involves many figures, and does not permit any good memorizable series. The inch cut up into the natural division by constantly halving permits the use of sizes best suited to the needs of the workmen.

The standard of the French system is a certain bar, kept for comparison; so is the English yard, from which we get our feet and inches. The high-flown notion that the metre is a measurable portion of the quadrant of the earth's circumference has been given up long ago, and the measurements of England and America are on a better basis of accuracy to-day than that of any other country. The French system theoretically predicates its weights on the weight of a cubic decimeter of distilled water at a temperature of 39.1 deg. Fahr., the weight of which is called the kilogramme, and is two and two-tenths of our pounds; but really the standard unit of weight is the platinum kilogramme-weight deposited in Paris.

In Germany you never hear of the kilo, but they sell by the pound, their pound being the half of one kilo; this they cut up as they please into smaller weights, and you can buy a pound of grapes or butter just as well as you can in America. It is claimed that given the metre, all weights, etc., can be deduced from it; in theory this is very well. The most skilled workmen, however, are not yet able to make two litres of water weigh alike to the utmost point of accuracy, and the cubical litre is not used, but is converted into a circular or cylindrical

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vessel, with all the trouble of the problem of squaring the circle.

If a bar of ordinary forged iron be planed up to measure one inch square, and the bar be one English yard long, it will weigh ten pounds, and the tenth of such a bar will weigh one pound more accurately than will the ordinary litre of water weigh one kilo. The English engineer in these days of iron knows when he uses shapes of iron rolled of uniform section that the tenth of their weight in pounds per yard give him the area of the section, and this admirable incident will long fix the desirability of the present unit of England and America.

When we consider the interest involved it will be seen that the population now making practical use of the English standard is greatly in excess of that using, by force, the French system. Millions of those numbered among the people who use the French system have no occasion to use any or know any system whatever, save in the crudest form.

Swedish iron and steel are rolled to English inches in size; so, also, their boards are cut to the English inch, because their market is largely in those countries that use the inch. In the Russian machine shops the English inch is used exclusively, and, as I have said, throughout all Germany it holds for all screw sizes. In France and Belgiem the yardstick is the metre hung from the rod, like the crossbracket of a drop gas light, placed about eighteen inches above the counter. In Germany the half metre, or twenty inches, about, is the measure used, and that held in the hand of a salesman by a handle at one end of the measuring stick. The Swedish machinist carries in his pocket a rule on which he has the English inch, and by its side the French measures; on the other side he has the two Swedish feet; one long in use and one ordered to be used but never put into practice. The Swedish roads are laid out now in kilometres, and marked by iron plates, giving at each ten kilometres the distance from some place, while half-way between is a sign 5 kl. This division of the roadway seems to them to be fine enough, as the old Swedish mile was six and two-thirds of our mile, and five kilometres is a less distance.

Carefully as I have considered this subject of weights and measures during the time I have been from home, I am the

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more confirmed in my opposition to the enforced adoption of the metric system of France in my own country, and firmly believe that those countries that have adopted it are at a disadvantage as compared to even the most imperfect of our systems. America has entered on the line of simplification of its metrology, and that is the direction that should be followed, not by any means giving up what is good, but by making what has been found to be practical better and simpler.

One has not to be long in England to find out how firmly are the seemingly complicated systems of weights and measures of that country fixed with the people. They weigh by the stone and compute by the sterling currency as rapidly or more so than we do with our dollars and cents, and that because their unit is larger. The English shopkeeper knows nothing about decimals, and says, if you ask him, that he has never learned what they are.

England has lately made legal the admirable standard manufactured by Sir Joseph Whitworth, and the chance of her adopting the metric system is not in the most remote degree possible.

Very truly,

COLEMAN SELLERS.

Eisenach, August 24, 1884.

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CHARLES CASEY'S SOLUTION OF THE MEANING OF THE "UNINTERPRETED SIGN:"

*A QUOTATION FROM AN ARTICLE BY COCKBURN MUIR.

"The crown and climax, however, of the evidence was the verification in the measures of an entirely unsuspected order of ideas, unrelated to any geometric or mathematical expression whatever. In the course of his explorations in 1865 (note that the *dates* are of vital consequence throughout the whole evidence) Piazzi Smyth was surprised to find in the entrance-adit that, while all the rest of the joints of the masonry were vertical to the direction of the adit, there are two on each side, a short distance from the entrance, which are vertical to the horizon. As they seemed to be intended as pointers to indicate some special feature, he made careful search, and discovered near the second joint on each side a remarkably fine and straight line; both evidently incised with finest care and precision. In 1867, in his book 'Life and Work at the Great Pyramid,' he described these lines, but could so little divine their intent that he called them the *uninterpreted sign.* But the strangest incident of the matter was that, while he measured every joint and stone of the interior that he could lay hands on, these two special and remarkable lines he passed over without measuring their position, content to note only their existence. We shall see presently that, as elsewhere throughout, his hand had been guided, so here it was stayed by Him whose Witness this is; that the evidence should be set above the breath of suspicion, and that it should be ultimately completed seven years later by totally independent and unconscious instruments.

"In the meantime a young naval architect, Robert Menzies, who has built one of the fastest craft that ever bent canvas to a slant of wind, and who, amidst his professional duties, has his mind occupied with high thoughts, was impressed with the con-

* In 'Life From The Dead,' Vol. iv., No. 45.

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viction that the lengths of the adits and gallery express *chronological* epochs; that the ascending-adit indicates the true interval from the exodus to the advent of Messias; and the gallery the duration of the present dispensation, specially indicated—first, by the sudden change from the low adit, of 52¾ inches vertical height, in which one must stoop, to the lofty 340 inches of the gallery; then by the 33 inches from the beginning of the gallery to the mouth of the well, corresponding with the years of our Lord's life on earth; and again by the 36 'overlapings' along the roof, corresponding with the months of His public teaching.

"In 'Egypt's Record of Time,' published in 1869, three years before the solution of the 'uninterpreted sign,' the Rev. W. B. Galloway established two things, (1) that our present reckoning of time, as from the incarnation of our Lord, is accurate within three months; and, (2) that the interval from the exodus to that event was 1540 years. My venerable friend, who rejects the witness of the Pyramid, could not foresee that he was thus furnishing independent evidence of its truth.

"The discovery that the sum of the diagonals of the base expresses the period of the precession, had already shown that inches of length were used by the designer to indicate years of time; just as in the base-side cubits are used for days. The measures gave for the length along floor of ascending-adit, from floor of entrance-adit to beginning of gallery, 1542.46 Pyramid inches, thus agreeing within small margin with the period deduced by an entirely isolated, careful and masterly investigation of the data of history and the records of Egypt itself.

"The engineers have always been to the fore in this business It is all in their line. But I beg you of your condescension to understand that, from their training, habits, and the nature of their duties, and very grave responsibilities, they are an incredulous and hypercritical set of mortals. Having to deal day by day with hardest of hard facts and driest of figures, the thing they hate most is a 'theory.' Their only touchstone is—'*practical.*' That engineer is a lost man who gets bitten of a 'theory.' In this question of the Pyramid they begin generally (again and again I have known it so) by treating it contemptuously. Then

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out of pure contradiction they look into the measures to find the means of demolishing the conclusions. Eventually they are conquered by the power of the evidence, and submit—like all well-disciplined minds.

"Another, then, formerly of this confraternity, but now—*poeta nascitur*—our excellent friend Charles Casey, with a softened heart of the arid and thirsty sort, but with a very hard head slow to be convinced, was not disposed to accept the conclusion of divine inspiration in the Pyramid without such evidence as should not be capable of misinterpretation. There were many more, myself included, who felt that a conclusion of that immense gravity was not to be lightly approached. He argued very discreetly that if the ascending-adit was truly *intended* to indicate prophetically the time from the exodus to the advent, and the gallery the dispensation of the New Testament, it was hardly conceivable that there should not also be some special *numerical* indication of the interval which was to elapse, from the date of the structure to the greatest of all events in human history, the coming of Christ. Following up, therefore, the extraordinary corroboration of Menzies' identification, and as the date had been astronomically determined as 2170 B. C., he enquired if there were any special feature at that number of inches back from beginning of gallery. Piazzi Smyth had never until then observed that the abnormal joints and the adjacent fine-ruled lines already described were at *about* that distance; nor, to quote his published words, 'ever thought of them before in connection with *possible indications of date*, or indeed of anything else by virtue of their precise and absolute *place*.' But the persistent postulant wanted to know their precise and absolute place. The Professor could not tell. *He had not measured it.* It became urgent, then, to write to Cairo, to another engineer, Mr. W. Dixon, who happened to be on duty in those parts, to ask him to supply the necessary measure. Although ignorant of the purpose, but specially desired to use the utmost precision, he took with him to attest and check his work Dr. Grant, of Cairo. It is necessary to observe very particularly that, as the distances of all the joints had been carefully noted, and published also to the world, by Piazzi Smyth,

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all that was asked from Cairo was the distance of the lines from the adjacent joints. When the measures were received, it was necessary only to deduct them from the distances of the nearest joints previously determined. The result was that the precise distances of the incised lines from the beginning of the gallery proved to be in Pyramid inches:

On the East Side,	2170.5
On the West Side,	2170.4

the difference between the two sides being thus only one-tenth of an inch. This occurred in 1872. Thus after seven years the 'uninterpreted sign' was interpreted, its mathematical value attested by unconscious instruments, the intervention of the divine hand made plain by incontrovertible evidence, the element of prophetic chronology in the Pyramid established, the prime reason for its existence explained, and the words of the holy prophet verified:—*In that day shall there be an altar to the Lord in the midst of the land of Egypt, and a monument at the border thereof to the Lord. And it shall be for a Sign and for a Witness unto the Lord of hosts in the land of Egypt.*"

AN EXTRACT FROM A LETTER OF CHARLES CASEY.

"In 1872," writes Mr. Casey, "I had been working for some four or five weeks on measures of the Pyramid, in search of an indication of the astronomically fixed date of erection, viz.: 2170. My search measures had been applied to the outside of the Pyramid; so, on writing to Piazzi Smyth on the fruitlessness of my work, he replied that he thought the test search should be applied to the interior, and not to the exterior, as regarded chronometrical data. Taking the thought into cogitation, and shutting out geodesic, astronomical and cosmical considerations as being interesting rather than vital as to the divine inspiration of the architect, there came into my mind one night (when reflection seethed in my thought) suddenly, as the opening of a door letting a flood of light into a dark chamber, a conclusive conviction, which, being put into words, said: 'If Muir's thesis is true, and the chronological metrology of the Pyramid retrospectively and prospectively inspired, there is *one date* in the time record of earth, viz.: the birth of

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Christ, which *must appear* in the Pyramid measure, else its character, as a monument whose architect acted under divine inspiration in its construction, has no confirmation in demonstrable fact.' Under this paramount conviction I wrote Piazzi Smyth, on the next day, the sum of my conclusion. To that letter I had no reply in ordinary mail course, and the matter lay dormant in my mind until some time after I received a letter from my good, zealous and patient friend, the Astronomer Royal, stating that, on receiving my letter, he had forwarded its thesis to Waynman Dixon, then in Egypt, who had gone critically over the passage measures and found, at 2170 inches from north end of grand gallery, the mysterious line which Piazzi Smyth had noticed and described in 'Life and Work' (1867).

"The astounding result completely unnerved me; the thought that here now in this, our generation, had been given an irrefragable testimony above and beyond the reach of verbal quibble or contest, to the truth of the Holy Scriptures and the divine nature of Jesus Christ; a testimony resting not on the sandy foundation of words, but on the rock-basis of infallible mathematics—the only science to which all rational minds, in every age and nation, are compelled to submit—giving, as before stated, its irrefragable demonstration of the absolute truth of the word of God in its testimony respecting His incarnate mercy in the person of 'Jesus the Prophet of Nazareth, of Gallilee.'"

STANZAS FROM "PHILITIS," OR THE SOLUTION OF THE MYSTERY WHICH FOR FOUR THOUSAND YEARS HAS SHROUDED THE GREAT PYRAMID IN EGYPT.

BY CHARLES CASEY.

Siriad! the land of mysteries sublime!
How Sihor's valley and its banks abound
With proofs that reach back to the youth of time,
Of art, skill, science, wisdom, high, profound,
Unmatched in any age, or race or clime.
Its temples, tombs and pyramids astound—
From Thebaid's solemn grandeur to the site
Where Jeezeh's structures guard historic night.

* * * * * * * *

How in its presence modern pride is bowed!
Its hoary wisdom whispering from the dead—
Sublime, mysterious, awful—with the shroud
Of forty centuries wrapped around its head,

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We catch its muffled tones, now low, now loud,
And hear, with wonder nigh akin to dread,
The cosmic truths now by its stones revealed,
Which for four thousand years have lain concealed.

By its vast hugeness mind and eye are dazed
And into silence awed. We stare and stand,
Striving in vain to grasp *how* it was raised—
To comprehend the skill by which 'twas planned.
Pigmies in mind and stature, stunned, amazed,
We gaze and feel before that structure grand—
The mightiest altar that has ever been,
Which cannot be imagined until seen.

* * * * * * * * *

But as that hoary pile doth still devour
Its shadow daily, so it seems to hide
Its secret truths. Four thousand years its power
Appeared, with magic mystery allied,
Until at length came the appointed hour
When scientific search, so long defied,
Expelled the Genii of the powers of night,
And gave its prisoned secrets to the light.

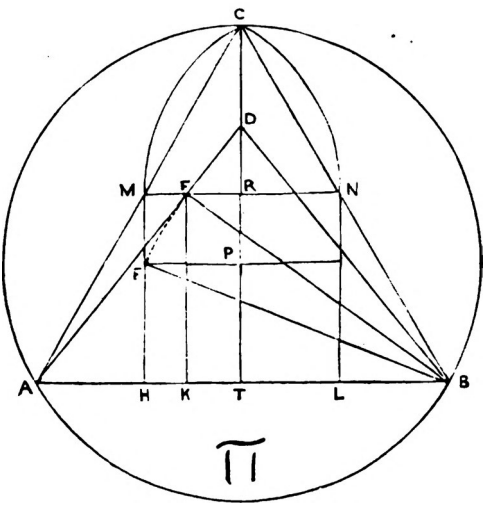
Honor to Smyth! and all that noble band
Of scientific men, who gave their mind
To rescue from the desert's drifting sand
The greatest truth to modern times assigned—
A revelation grandest 'mid the grand
Of all that science gave to human kind;
An honor to their nation, age and race,
Who have achieved what time can ne'er efface.

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PI.

The value of π is found to within $\frac{1}{100000}$ by the following geometrical construction. It gives the height of the Pyramid 5818.46, or one-sixth of an inch less than π gives, the geometrical base being 9139.871.

Construct the equilateral triangle ABC circumscribing the square HLNM. Through the centre of the triangle draw EP parallel to HL. With EB as a radius, describe the arc EF intersecting MN in F. Through F draw AD; then $\frac{AT}{DT} = \frac{AK}{FK} = .7854$, which is the number commonly used for $\frac{\pi}{4}$.



Let RN = 1; then $CR = \sqrt{3}$, $CT = 2 + \sqrt{3}$, $BT = \frac{2 + \sqrt{3}}{\sqrt{3}}$ $PT = \frac{1}{3}(2 + \sqrt{3}) = EH$, $EH^2 + HB^2 = EB^2 = FB^2$, $KB^2 = FB^2 - FK^2$ and $AK = 2BT - KB$; hence $\frac{AK}{FK} = .7854$.

H. G. Wood.

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PREFACE TO LIEUTENANT TOTTEN'S BOOK, 'AN IMPORTANT QUESTION.'

The race to which these pages are dedicated is by blood, by letter and by the spirit, literally "called in Isaac's name." As Saxons, they are the lineal descendants of the "Saka-i-Sunnia," or "Sons of Isaac;" while, by the particular branch through which they derive their lofty genealogy, they are the posterity of Joseph, "the beloved son," to whom pertained their birthright.

The Egyptian extraction of his two sons, Ephraim and Manasseh, bequeaths to them, together with all the blessings "of him who was separated from his brethren," an inheritance none the less royal and significant in the mysterious land of their mother, Asenath, the daughter of Potiphera, prince of On." Though, like another and greater son of Jacob, it is true that they were, in early days, "called out of Egypt," it is none the less true that the summons was simply given to them for the purpose of extending the possibilities of their ultimate dominion.

In these latter days, when the ends of the earth seem literally to draw nigher to us, when every nation is so deeply impressed with the uncertainties surrounding the long contested solution of "the eastern question," when an intense and ever increasing expectancy has settled down upon the whole human race, it may well be asked if it is not a little remarkable to see the flags of these two *brother* nations united for the first time since their independence, in the streets of Alexandria? In 1882 the bronzed tars of England and America, of "brothers John and Jonathan"—the only nations called "brethren" upon the face of the earth—landed together on the shores of the delta of that ancient stream, upon whose banks their fathers, also brothers, had lived as princes twice eighteen centuries before. Shall we endeavor to convince ourselves that in this act there was no overruling exercise of that will which weaves the thread of destiny? Or shall we cease to doubt, and yield to the conviction that there is indeed a power that giveth the dominion unto whom it will?

In the same year, 1882, both England and America struck off commemorative medals, upon whose reverse faces the two most mysterious emblems of Egypt, the Sphinx and Pyramid, were severally displayed as central devices. In their inception these medals had not the remotest connection. The one was the Egyptian war medal of Great Britain; the other was the centennial seal medal of the United States. Nevertheless, a strenuous effort was made to induce the Queen to adopt the Pyramid as a central emblem for the British war medal. It had already been used by America that very year; and it was not likely that an occasion for its simultaneous employment by the two nations would soon, if ever again, occur. But Ephraim is not Manasseh, and so the idea of the Sphinx was adhered to by our fraternal nation as for it the most appropriate. Was Providence, which counts the hairs upon a human head, also an unconcerned spectator then? And were these matters really trivial things, and after all of no historic moment?

> "There's a divinity that shapes our ends,
> Rough hew them how we will."

And it was no accident that the greatest commercial city of each of these two brothers and Egyptian nations was at this time graced with one of the two obelisks that, when their father Joseph married the Princess Asenath, had stood, like Jachin and Boaz, in strength and beauty on each side the portal of her father's temple.

Who, indeed, shall say that, in youthful sports around the entrance to that noble shrine,

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their fathers did not choose, as children do to-day, and even name as "Ephraim" and "Manasseh" each one, the self-same pillar, which, in centuries then to come, the powers that overrule have now brought by such natural means to the more modern homes of their descendants, and have stationed at the very gates of all their greatness?

There is undoubtedly an inheritance in the land of Egypt for the Anglo-Saxon race, and the day has dawned when it shall be given unto those whose right it is.

* * * * * * * * * * * * *

In our treatment of this subject, we shall first examine into facts which lie near home, and see in how much or in how little the Anglo-Saxon race is actually in possession of the blessings promised unto Ephraim and Manasseh as the sons of Joseph. We shall then ask our readers to accompany us through some studies of this remarkable monument, and by the way, shall gather not a little from the God-designed metrology of Israel, of highly scientific import.

The hierarchy of science so-called has long since agreed to disregard as totally unreliable every structure a single stone of whose foundation has been quarried from the eternal word of God. Any appeal to the Scriptures, no matter how modest, is so thoroughly at variance with the modern methods of philosophers that the book of an author who has searched the Scriptures for guidance towards the eternal truth of things, is condemned unread, stamped with the seal of disapproval unopened, and burned relentlessly without a hearing, lest the people, having read it, should pronounce it true and learn to disregard their would-be teachers.

But it is not to be expected that a book so full of stumbling blocks, offensive to their theories of evolution, as is the Bible, should find any favor or receive the least toleration at the hands of modern scholars. From the dust they love to feel that all around has risen, and without a God; and into the silt of a disintegrated, dead and formless universe, they trust at length their worn-out essences will sink into eternal sleep. Modern science, disguise it as we may, is thus at heart not merely far at sea upon the waves of doubt, but is essentially an atheistic school that has no God, and which has long since closed its doors against the written Word.

From this school, therefore, the present volume does not expect a single meed of praise, but here I am content. Were it to be otherwise—were recognition granted to the thoughts advanced by our self-styled scientific teachers—I should feel that the light in which these pages had been written was but an *ignus fatuus* from the swamp of things that soon must pass away. I write, however, for the people whose concern alone this matter is, and who still read the word with simple trust; and though my subject is of the highest scientific nature, I doubt not they will find it clear, as truth is ever to be found, and not so intricate but that it will be filled with what to every mind is deeply interesting, and also find it to be well within the scope of even moderate education and capacity.

As a matter of fact the Bible deals at great length with this very subject of metrology. Around it the whole of the Hebrew polity harmoniously arranges itself, and very naturally, too; for a just and perfect life was all it aimed at inculcating; and the very measure of fair dealing, of justice and truth, is centered in and squared and righted at an honest and an accurate standard, too sacred to be ever lengthened or diminished by any possibility of double dealing.

As the study of metrology inevitably leads us to the study of the Great Pyramid of Egypt, so, too, it leads all dwellers in the land of Manasseh to look with greater interest on the arms and crest and seal chosen for the nation's blazonry by ancestors who wrought more wisely than they knew. The United States of America has been a nation marked out by special manifestations of Divine Providence from their very beginning until now.

In was in their earliest struggles that they looked towards this western wilderness; and behold the glory of the Lord appeared in the cloud, and led them to their favored habitation. By faith, like Abraham their ancestor, when called upon to go out into a place

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which they should afterwards receive for an inheritance, they obeyed and went out, not knowing whither they went, and dwelt in their land of promise as in a strange country. But the clouds of the Almighty were about their habitation, so that the sun smote them not by day, neither the moon by night. It is, therefore, in their crest they fittingly commemorate how by faith there sprang from even one, and him as good as dead, so many as the stars of the sky in multitude. It is, therefore, in their motto they repeat this reference, and intensify the idea of union by that beautiful allusion to the universal brotherhood of all mankind, who in Christ, as St. Paul truly says, are "many in one."

This was indeed the nation that fled into the wilderness borne upon eagle's wings—the goddess of liberty, clothed with the sun, bathed in the cloud-reflected colors of her flag, and crowned with the stars that marked the union of her States and pointed out their lofty origin. And her eagle guardian was the Lord of Hosts himself; for as an eagle stireth up her nest, fluttereth over her young, spreadeth abroad her wings, taketh them, beareth them on her wings, so the Lord alone did lead his people towards the land of freedom, and there was no strange god with him.

Truly, then, may all the nations of the earth exclaim, "Who is like unto thee, O people saved by the Lord, who is the shield of thy help? Thine enemies shall be subdued unto thee, and thou shalt tread upon their high places. In peace thou shalt be like unto thy father Joseph, a branch planted by the river of water that bringeth forth his fruit in his season; thy leaves also shall not wither, and behold whatsoever thou doest it shall prosper."

Then may Jeshurun, the wise people, fittingly reply, "There is indeed none like unto the God of Manasseh, who rideth upon the heavens in my help, and in His excellency on the sky, the eternal God is my refuge, and underneath are the everlasting arms."

Upon the reverse of our national seal the references to our birthright as descendants of Joseph and Manasseh, and thus of Egyptian origin, are even still more pointed. The leading motto—"*Annuit Coeptis*" ("He has prospered our beginnings")—is a direct use of an expression so often reiterated in the Bible story of Joseph, that he has become the very type of a prosperous man."

In the capstone we have again not only the emblem of that Divine Providence which crowned our efforts as a struggling people, but of the Saviour of his people, in whom alone our building, fitly joined together, groweth upwards into that perfect union of the human and divine. The building—a pyramid unfinished—an emblem of stability, of perfect measure, just weight, and of eternal truth, and harmony with nature, man and God, is eminently the Egyptian emblem of Manasseh. The date upon its base is his year of maturity—MDCCLXXVI., and marks the dawn of another golden age, as the motto below expressly indicates:

"*Novus ordo seclorum.*"

This motto is an intentionally altered quotation from Virgil's Fourth Eclogue, and was borrowed in turn by Virgil from the mystic Sybilline Records. The text opens as follows: (Translation):

"The last age of Cumean song now comes;
Novus ordo seclorum—a mighty order of ages is born anew.
Both the prophetic virgin and Saturnian kingdoms now return;
Now a new progeny is let down from the lofty heavens;
Favor, chaste Lucina, the boy soon to be born,
In whom the iron age shall come to end,
And the golden one arise again in the whole earth."

Words would be exhausted in any attempt to do justice to the thoughts that find birth in the contemplation of the American era. Unique with the rest of the symbolism upon the long concealed face of our great seal, this motto comprehends in itself the whole of the

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Virgillic Sybilline fragment just translated. It is unique in its reference to the birth and genius of American institutions—institutions that cannot pass away, and whose full development no hand can stay from reaching the goal of their most perfect realization. The new order of things has been let down from heaven, not again to be withdrawn from earth; but this motto is also most beautifully in harmony with the entire reverse of the seal itself; and it conceals a hidden reference to the Great Pyramid above—the legacy of an *earlier* golden age to ours.

In this, "the last age of Cumean song," it is our task to rebuild the monument of just weights and perfect measures. In the day of liberty, now fully dawned, the recognized equality of all demands, as the foundation of society, perfect justice in the dealings of man with man; and it is only in the rediscovery of the secrets of true pyramidal construction that the new order of the ages can be founded in stability.

When, at length, therefore, we Americans—as the children of Manasseh—have fully come to read our title clear to this inheritance, so grand and so far-reaching, how pointedly will the blessing of the great ancestor who adopted us—for we were half Egyptian—and made us equal to his own, be named and numbered on us.

"He, (Manasseh," said Jacob, when he blessed our fathers), "also shall be a great people." Thus he, whose name was changed to Israel, made us greater than his own; since from all he took the birthright, and conferred it upon the two adopted sons of Joseph—upon Ephraim and upon Manasseh, upon England and America; that is, upon the Anglo-Saxon race.

THE INTERNATIONAL CONGRESS TO DETERMINE A PRIME MERIDIAN.

OPENED AT WASHINGTON, OCTOBER 1, 1884.

AN ACT to authorize the President of the United States to call an international conference to fix on and recommend for universal adoption a common prime meridian to be used in the reckoning of longitude and in the regulation of time throughout the world.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be authorized and requested to extend to the governments of all nations in diplomatic relations with our own an invitation to appoint delegates to meet delegates from the United States in the city of Washington, at such time as he may see fit to designate, for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time reckoning throughout the globe; and that the President be authorized to appoint delegates, not exceeding three in number, to represent the United States in such international conference.

Approved, August 3, 1882.

The list of countries represented and their delegates, is as follows:

Austria-Hungary—Baron Ignatz von Schaeffer, E. E. and M. P.
Brazil—Dr. Luis Cruls.
Colombia—Com. S. R. Franklin, United States Navy.
Denmark—Mr. Carl Steen Andersen de Bille, Minister Resident and Consul General.
France—Mr. A. Lefaivre, M. P., and Consul General, Mr. Janssen.
Germany—Baron H. von Alvensleben, E. E. and M. P., and Mr. Hinckeldeyn.

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Great Britain—Capt. Sir F. G. O. Evans, Prof. J. C. Adams, Lieut. Gen. Strachey, Mr. Sandford Fleming.

Guatemala—Mr. Antonio Batres, E. E. and M. P., and Mr. Miles Roch.

Hawaii—Hon. W. D. Alexander and Hon. Luther Aholo.

Italy—Count de Foresta, Secretary of Legation.

Japan—Prof. Kiknchi.

Liberia—Mr. William Coppinger, Consul General.

Mexico—Mr. Leandro Fernandez and Mr. Angel Arguiano.

Costa Rica—J. F. Echeverria.

Netherlands—Mr. G. De Weckherlin, E. E. and M. P.

Paraguay—Mr. John Stewart, Consul General.

Russia—Mr. Charles De Struve, E. E. and M. P., and Maj. General Stebnitzki, le Conseiller d'etat Actuel Kologrivow.

San Domingo—Mr. M. De J. Galvan, E. E. and M. P.

Spain—Juan Pastorin Juan Valera, Spanish Minister, and Emilio Ruiz del Arbol.

Sweden and Norway—Count Carl Lewenhaupt, E. E. and M. P.

Switzerland—Col Emile Frey, E. E. and M. P., and Prof. Hirsch.

Turkey—Tewfik Pasha, E. E. and M. P.

Venezuela—Senor Dr. A. M. Soteldo, Charge d'Affaires.

United States—Rear Admiral C. R. P. Rogers, United States Navy, Mr. Lewis M. Rutherford, Mr. W. F. Allen, Commander W. T. Sampson, United States Navy, and Prof. Cleveland Abbe.

A delegate to the Conference writes as follows:

WASHINGTON, October 23, 1884.

My Dear Sir: Yours of the 29th of September duly received. The metric system was brought up by the Spanish delegates, but it was ruled out of court by the chairman, and there it ended.

I enclose a copy of the resolutions passed. We had a final vote yesterday, after twenty-two days' cogitation and delay. The business is now over, and the world will have a universal time based on principles I have long advocated.

RESOLUTIONS.

In case the Conference shall not adopt the resolution proposing a neutral meridian, it is intended to introduce the following, and copies are distributed with the hope of saving time:

Resolved: That the Conference proposes to the Governments here represented the adoption of the meridian passing through the centre of the transit instrument at the Observatory of Greenwich as the initial meridian for longitude.

Resolved: That from this meridian longitude shall be counted in two directions up to 180 degrees, east longitude being plus and west longitude minus.

Resolved: That the Conference proposes the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local or other standard time where desirable.

Resolved: That this universal day is to be a mean solar day; is to begin for all the world at the moment of mean midnight of the meridian coinciding with the beginning of the civil day and date of that meridian, and is to be counted from zero up to twenty-four hours.

Resolved: That the Conference expresses the hope that as soon as may be practicable the astronomical and nautical days will be arranged everywhere to begin at midnight.

Passed the 22nd of October.

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LETTERS.

LETTER FROM S. BESWICK.

STRATHROY, ONTARIO, September 18, 1884.

My Dear Sir—I had partly determined not to write any more just yet, and lie still for awhile, but I at length concluded to send you this article, as a specimen of the outcome of my studies this summer.

I hold the opinion that we shall find the line of the casing sides overlaping the line of the sockets, and that the Expedition will discover the proofs on a careful search of the rock outside the sockets. A discussion of the point will do good. You will observe my claim in the article is clear and definite, that the geometrical basis is the true base, and the only actual base the Pyramid ever had. I do not accept any other base as the builder's base than 9139.8712; the geometrical base is the only base it ever had. This is my theory, and it is the only one that will stand the test of future and present investigation. But if we accept the socket-levels of Petrie as the corners of the Pyramid base, then the case is different. The more Mr. Wood, Mr. Skinner and others investigate and compute, the more they will get puzzled and fall into inconsistencies, fancies and speculations. The simple theory of a geometrical square of 9139.8712 inches to a side, as being the actual square of the Pyramid will relieve the mind from all difficulty, and, what is better than all, we shall then have a square which our formulæ can measure infallibly to the one million millionth of decimal figures, if we choose to be so very exact in our computations. I have given up Petrie's socket levels and side lengths as an authority, and have fallen back upon the formulæ of the Institute as the only reliable ones, as they give better and closer results, besides being more consistent with the interior measurements. I find no authority will do this but our own formluæ. For, on examining the most approved measurements of Petrie—approved by himself I mean—and the best measurements of the day, I find they are nothing more nor less than simple approximations to the results given by our formulæ. And thus I stand immovably fixed in our own standards.

I again conclude with the declaration that the original base of the Pyramid—the actual base which the builders placed on the hill of Gizeh—was identically the same as the geometical base of 9139.8172 inches to a side, and that it had no other base. It was a perfect square with equal sides, and that the heel of the corner stones was placed in the socket, whilst the foot and front part of the casing stones overlapped the sockets on all the four corners.

Respectfully,

S. BESWICK.

LETTER FROM JOSEPH BAXENDELL.

August 7th, 1884.

My Dear Sir:—I have to-day received from some unknown friend in America a copy of *The Churchman*, of July 19, 1884, which contains a review of a paper entitled 'The Imaginary Metrological System of the Great Pyramid of Jeezeh,' by F. A. P. Barnard, LL.D., and it is deplorable to see in a periodical bearing the title of *The Churchman*,

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such an exhibition of unchristian feeling and language as is shown in this review. No one earnestly seeking the truth and anxious to act without prejudice could write in the spirit displayed by the writer in the paper and his reviewer; nor speak of the common belief that the design and building of the Great Pyramid was of an inspired mind, as "imputing to the Supreme Ruler of the universe a project so wild, so cyclopean, so almost stupidly idiotic, as that of heaping up six and a half millions of tons of rough limestone blocks about a hollowed piece of granite which has been at the mercy of the tourist for centuries, mutilated and desecrated, in order that the English speaking races of the world might, in the nineteenth century, use a quart and a pound which have no direct relation to the length of a foot," nor could any one having a strict regard for the truth unblushingly write that "the Virgin Mary, herself resting at Matariah, and living at Heliopolis, might have learned the length of the human life of her Son by simply traversing part of the passage in the structure which confronted her Egyptian home," although, as the writer is no doubt aware, neither the Virgin Mary nor any one else knew of the existence of the passage referred to. When the advocates of a cause find themselves driven to attempt to support it by statements like these, it is evident they feel keenly the weakness of their case, and have little hope that it will meet with general acceptance.

With an utter disregard of the truth, it is stated by the reviewer that "the array of new facts which Petrie's book presents demolishes completely the pretensions of the Pyramid religion, and buries beyond all hope of resurrection the ingenious theories of Mr. John Taylor and Professor Piazzi Smyth," whereas Petrie's new facts have all given additional support to these theories and established them on a basis which is not likely to be shaken by all the "sound and fury" and irreverent language of disappointed anti-pyramidists.

In my letter of July 7, I believe I stated that the result of the Belgian observations of the last transit of Venus gave a sun distance of 91,756,800 British miles. In the report I had seen the resulting parallax was stated to be 8.909", but I find that in M. Houzean's complete report it is stated to be $8.911'' \pm 0.084''$, which gives the sun's distance=91,731,600 British miles, or 105,400 miles less than the Pyramid distance which Dr. Barnard says "is only about a million of miles too short!" It remains to be seen whether he will now have the manliness to admit his error and retract his inconsiderate statement.

I remain, my dear sir,

Yours very truly,

JOSEPH BAXENDELL.

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TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

SEPTEMBER 10, 1884.

In consequence of the storm, only four persons were present. The meeting, therefore, adjourned after a brief discussion to September 24th.

SEPTEMBER 24, 1884.

Notwithstanding the opposition of the elements, a large audience assembled in the hall of the International Institute for Preserving and Perfecting Weights and Measures.

After the election of members the first business before the meeting was the reading of a letter from the Secretary of the New York and New Jersey branches of the International Institute, requesting that the members of the Institute in Cleveland would co-operate with those branches with regard to "an open letter to the President of the United States" and "argument by committee," which were brought before the notice of the society at a previous meeting. In Mr. Latimer's remarks upon this subject he explained the necessity for bringing the aims of the Institute before our representatives in view of the International Conference which will convene at Washington on October 1st. A letter was then read from George C. Mason, Secretary of the American Institute of Architects, requesting that a delegate from the International Institute might attend the meeting of architects in Albany, October 22d, to read a short paper, or give an oral description of the work of the society. Rev. H. G. Wood, of Sharon, Pennsylvania, was accordingly appointed to represent the society at Albany.

Mr. Latimer then gave a short exposition of the work of Lawrence McCurrick on "Planetary Motion." He demonstrated on the blackboard Mr. McCurrick's method of obtaining the relative distance of the planets by geometry, and showed some very close and curious arithmetical coincidences and relations. Professor Stockwell in his criticism admitted the ingenuity of Mr, McCurrick's method, but said that no effective practical result could be obtained by it.

Rev. H. G. Wood next showed the connection between ancient and modern measures and their geometrical proportions. He then read and illustrated a paper by F. A. R. Winter, of Demerara, British Guiana, on the "Sacred Chronology in Correlation with the Measures of the Great Pyramid." Rev. E. P. Ingersoll, of Rosevale, Kansas, was then introduced by the president, and lectured upon "The Identity of the Anglo-Saxons with the Lost Tribes of Israel."

The members elected were Charles E. Bliven, Toledo; J. R. Bryden, C. E., Demerara, British Guiana; John Forrest, M. D., Charleston, South Carolina; Mrs. Dr. Elmira G. Howard, Cincinnati; George C. Mason, Newport, Rhode Island; Jesse Opperman, C. E., Buffalo; George Engel, Cleveland.

OCTOBER 8, 1884.

In the absence of the president, Vice President A. M. Searles occupied the chair at the meeting of the International Institute for Preserving and Perfecting Weights and Measures. Mrs. D. White, Black Creek, Ohio, was elected a member. A letter was then read from George C. Mason, Secretary of the American Institute of Architects, expressing his satisfaction at the appointment of Rev. H. G. Wood as delegate from the International Institute to the convention of architects to be held in Albany, October 22d, 23d and 24th. Mr. Wood, who has just returned from Washington, wrote that at the second sitting of the International Conference there, the French repre-

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sentative was not in favor of Greenwich meridian as the prime. The discussion was very warm. England and America would not consent to a change from Greenwich. It would cost the American government $1.000,000 and the British £1,000,000 to alter the charts. Mr. Wood says: "I do not think we have anything to fear for the preservation of our weights and measures. If the International Congress do recommend the adoption of the French metre, there will be abundant and public opportunity to resist it when the subject comes before the United States Congress, but I believe our government has gone as far in the matter as it will go."

With reference to the International Conference Theo. Cribi sent an extract from a letter of Dr. Hirsh, who declined the appointment of representative of the Swiss government. He says: "I forsee, however, that the important reform, the unification of longitudes and time reckoning, for which I have worked a great deal, will not finally be settled in Washington, by reason of the French, who will create an opposition to it, and the probable absence from the Congress of the Germans, as well as by reason of the mistake the American railways have made in adopting in too great a hurry a bastard and irrational solution in introducing the system of hourly meridians, but to postpone is not to give up. The matter will be taken up again later, in a more propititous moment. An article from the Philadelphia *Ledger* from the pen of Coleman Sellers, who writes from Eisenach, was then read.

The reading of this paper was followed by a lively discussion, and it was recommended that it should be published in pamphlet form for circulation among manufacturers and machinists.

An article from Joseph Baxendell, astronomer, England, pointed out many fallacies in the papers of President Barnatd on pyramid metrology.

A paper was then read from H. W. Oswald, of San Francisco, California. The views of the writer were criticised by Dr. Redfield, Mr. A. M. Searles, Mr. W. Bond and other members. The discussion was very animated. The meeting adjourned for two weeks.

OCTOBER 22, 1884.

Vice President A. M. Searles acted as chairman in the absence of the President. Rev. Mr. Barber, Williston, Vermont, was elected an honorary member, and the Lady Georgiana Needham, Datchet, England; W. E. Chase, Holyoke, Massachusetts; Samuel C. Goodsell, Westville, Connecticut; C. B. Whyte, Hamilton, Canada; A. A. Jones, Williamstown, Massachusetts; and Henry Kellogg, New Haven, Connecticut, were elected members.

A discussion then took place with regard to the annual convention of the Society, and the following resolution was presented by the chairman and adopted: "The annual meeting of the Society will be held as follows: The 8th day of November is the duly appointed day for the purpose, but in view of the fact that the day following is the Sabbath, which will interfere with the attendance of some members from distant parts, the annual meeting will be held on Tuesday, the 11th of November, at the Society's rooms in Cleveland, Ohio. At this meeting the election of officers for the ensuing year will take place. A charter legalizing the Society's existence in the State of Ohio will be presented for adoption, and papers will be read and discussed."

All persons interested in the objects of the Institute will be welcomed at the convention. Members who are prepared to read papers on the occasion will please notify the President of their intention without delay. Accommodation will be provided for members from a distance.

Letters were then read from several members. J. E. Hilgard, of the United States Coast Survey, Washington, wrote with reference to the International Conference. He says: "You need not think that the convention will have any influence upon the adoption of the metric system. The definition of the power of this convention is so circumscribed that directly the metric question cannot be touched. Indirectly, England will doubtless

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be so much complimented by the adoption of the Greenwich meridian as to make her become a party (as indeed she has already done) to the International Bureau of Weights and Measures near Paris, but she will not budge from the two-foot rule until long after the Americans have given up the Anglo-Saxon units—observe that we are much more facile in change than the English.

"The resolutions of this convention are a foregone conclusion. They will simply recommend Greenwich midnight and the reckoning half way round in each direction—in fact just what we are doing now. The whole business of the International Convention is gotten up in order to save the *amour propre* of such small countries as France and Spain (who have prime meridians of their own) by giving them an opportunity to accede to the expressed wishes of the whole world."

This letter was received before the convention adopted Greenwich as the prime.

Mrs. E. Bedell Benjamin's paper on "The Sphinx" was then read by the Secretary. It was heard with rapt attention and occasioned a spirited discussion, in which Mrs. A. M. Searles, Dr. Redfield, Mr. Joslyn and others expressed their views. The meeting then adjourned till November 5th.

TRANSACTIONS OF THE NEW YORK AND NEW JERSEY BRANCH OF THE INTERNATIONAL INSTITUTE.

An important regular meeting was held at room No. 24 Cooper Union, New York City, on the evening of September 24, 1884. The meeting was called to order by Vice President Kellogg, who invited Lieut. C. A. L. Totten to act as secretary pro tem, in the absence of Mr. J. N. Wing. Present at the meeting and taking part in its discussion were representatives from several leading architectural, mechanic and physical societies, who had come together to confer upon the metrological questions now before the country, in reply to a printed circular sent out requesting such attendance.

After the usual routine of business, during which the chairman detailed the objects of the International Institute to the visitors, Colonel Chester, chairman of the committee to correspond with the Executive of the United States relative to the appointment of delegates to the International Congress on Prime Meridian, made his report. Colonel Chester then discussed the subject in general as correlated with metrics, and the necessity of a nomenclature and method in the technology of forces, etc., and of computing longitude and time. During the evening extended remarks were made, in order, by the following named gentlemen: Rev. A. D. Barker, Jacob M. Clark, C. E., and Mr. O. P. Hatfield, Treasurer of American Institute of Architects. The remarks of all these gentlemen were of the most interesting and important nature.

At the termination of the remarks the following resolutions were passed by those present:

Resolved: That it is the sentiment of this meeting that the International Convention called by the United States Congress for the purposing of determining upon a standard meridian, has no right to go beyond its commission and discuss, even as a measure of compromise, any system of weights and measures.

Resolved: That the thanks of this Institute be extended to the press for co-operation and notices of our meetings.

Resolved: That this Institute appreciates with thanks the courtesy of the *New York Evangelist*, and the *New York Observer* extended in behalf of the objects of our association.

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Resolved: That special thanks be proffered to Rev. A. D. Barber, of the *New York Observer*, for important investigations, and for his valuable and instructive address this evening.

Resolved: That Rev. A. D. Barber, B. S. Church. C. E., Jas. Kitchen, Esq., Geo. Henry Felt, C. E., Chas. K. Graham, C. E., and C. W. Havemeyer, Esq., be eonstituted honorary members of this Branch, and that the secretary be instructed to forward them copies of this resolution.

There being no further business before the meeting, it adjourned to come together at the call of the President.

C. A. L. TOTTEN, U. S. A.,
Secretary Pro Tem.

EDITORIAL NOTES.

Important papers, read at a meeting of the New York and New Jersey Branch of the International Institute, by Colonel Stephen M. Chester, Jacob M. Clarke, C. E., Lieut. C. A. L. Totten, Rev. A. D. Barber and Mr. O. P. Hatfield, arrived too late for publication in this number. We hope to present them to our readers in a subsequent issue.

In consequence of a press of matter we are obliged to postpone the publication of able papers by J. K. Hornish, H. W. Oswald, Rev. H. G. Wood and F. Hess; also, of a large number of important letters and the systems of tables that we proposed to compare in this issue. For the same cause we have held over a portion of Mr. Latimer's paper on "The Unveiling of Isis." It contains some wonderful prophecies concerning America, chiefly gleaned from Charles Sumner's work, with a graphic summing up by Mr. Latimer.

My friends, members of the Institute and readers of the Magazine, I promised in my last to present you my investigation touching the relation of the subject of Isis to my theme, and to conclude, but moved by the advice of my friends not to omit any part of the details of the incidents which have occurred in my experience, and called suddenly away from my home and place of business, here, upon the rocky mountains in Idaho, overlooked by the hoary peaks, covered with eternal snows, which rear their heads above us, surrounded by hardy miners, who,

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with their engines and drills and hammers, are perforating and piercing the mountains upon every side, and drawing therefrom their hidden treasures, which are now bringing our country up to the highest point of wealth and prosperity and fulfilling the visions and dreams of our voices, prophets and poets, yet to be extended farther than the imagination of poet or sage ever dreamed or thought, I have departed from my programme and present you another chapter. It shall be for you to judge whether they are words in the right place. In the next paper, if possible, I will conclude, presenting you with those mysterious links in the chain of evidence which, I feel sure, will prove that our country was the burden of the myths, the glory of the constellations, the song of the poet, and the inspired words of the prophet of the Lord.

CHARLES LATIMER.

REVIEWS.

THE WORD, THE WORLD, THE BRANCH. By J. Leyland Feilden, Esquire, author of "Links in the Chain of Evidence Connecting Israel and England;" "The Gentiles and the Times of the Gentiles;" "Israel Jubilee, or 1882;" "Israel Ubiquitous," Etc., Etc.

Mr. Charles Latimer sends us from Idaho Springs, Colorado, a comprehensive review of this book, which we will present in our next issue. Mr. Feilden is a member of our Institute, earnestly devoted to its objects. We ask his fellow members to give his works a hearing. They are published by Robert Banks, Racquet Court, Fleet Street, London, England. It is a most remarkable work, and we tender our grateful acknowledgment to the author for his consideration and attention in sending it to us.

We call the attention of our readers to an able work by J. P. Weethee, Millfield, Ohio, "The Coming Age; Its Nature and Proximity." Price $3.00. The book can be obtained from its author, or from C. H. Jones, No. 77 Clark St., Chicago, Ill.

PROF. VAIL'S THEORY.

After examining this Theory we feel disposed to place some of its important features before our readers. Ten years ago Mr. Vail published a little volume, entitled 'The Waters Above the Firmament,' which was intended to show that the earth at

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one time possessed an annular system, or system of rings and belts of aqueous vapors and other matter, similar to Saturn and Jupiter. A second edition, greatly enlarged, is now being prepared for publication.

He first assumes, what no scientist will dispute, that if the earth ever was in a molten state, all the waters now on its surface were in a vaporous form in a vast atmosphere of great complexity of materials. He next by a mathematical and philosophical demonstration proves that if the earth revolved with this great atmosphere, at least once in twenty-four hours, it must have thrown these vapors into rings over the equator.

Having thus established himself upon a rock apparently impregnable, he proceeds step by step, fortifying every inch of his progress, until he leaves the reader without the shadow of a doubt that another grand truth has been discovered. He shows how the innermost ring must have been the heaviest on account of the heavy materials that impregnated the vapors and settled nearest the earth, and, descending to its surface in the first ocean, formed the first sedimentary rocks—the metaliferous rocks of Archaen time.

He shows how the terrestrial heavens became clear again and again, and again and again became over-canopied by vapors descending from equatorial rings. That when a ring of vapors descended into the atmosphere it spread from the equator toward the poles, forming a great greenhouse roof over the world, annihilating the change of seasons and preventing the alternation of day and night on account of the universal diffusion of solar heat and light, and thus becoming a competent cause of all the climatical changes of geologic times, from the ages of eternal spring to those of eternal ice and snow. He shows most conclusively that all the glacial epochs were occasioned by mighty downfalls of these telluris-cosmic vapors in the polar regions. He shows that the dark belts of Jupiter and Saturn are *unconsumed carbon* lifted to their present position from those burning orbs. Says he, "A molten world must have been a smoking world, but a smoking world produced *soot* or unconsumed carbon; but soot or carbon must become a *bituminous oxydized* hydro-carbon in contact with air or aqueous vapor, and as the earth *was* a molten mass it subsequently had belts of carbonaceous matter that did descend on the earth, whose very presence is demanded by inexorable law to account for the coal formations of the world."

He shows that every geological age was introduced first by a wide-spread fall of waters, followed by continental upheaval and rock plication, which can only be explained by an augmen-

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tation of oceanic waters. This he makes so plain that even a child can see that it must be true.

When the geologic ages have closed, he simply *proves* apparently beyond a peradventure, that the last or outermost ring of vapor descended into the air and spread as at other times from the equator to the polar regions in its effort to reach the earth, causing all the phenomena alluded to in Genesis, and here our author shows himself complete master of the situation by harmonizing every minutiæ with *law*. The six days of creation are explained on principles unthought of before. Eden and its entire field of mysteries assume a grandeur before unknown. The deluge becomes a philosophic necessity.

Over all this the reader must stand astonished and amazed; we simply confess our surprise at the unspeakable harmony (proven as it is by the very light of law), existing between Genesis and the book of nature. It becomes the duty of every student of nature—nay, of every man, woman and child to read and examine this great work of Prof. Vail's, who has promised us to publish his book of 400 octavo pages as soon as he can be sure of selling 1,000 or more copies. Let the readers of the STANDARD send their pledges to him at Barnesville, Ohio. The book will not cost over $2.00, possibly less.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD FROM SEPTEMBER 1ST TO OCTOBER 31ST.

SEPTEMBER—Mrs. D. White, $10; Herbert Wallis, $10; Dr. John B. Kellogg, $10; E. Coombs, $2; George Cheesman, $2; Jesse Opperman, C. E., $2; Mrs. Lucretia R. Garfield, $2; Dr. John Forrest, $3; B. F. Morse, C. E., $2; F. A. R. Winter, $15; Geo. Engell, $2; Jonas Pierce, $5; John B. Jervis, C. E., $5; A. H. Stebbins, $2; W. K. McAllister, $1; R. W. Burnett, $25; A. M. Searles, $3.50—Total, $101.50.

OCTOBER—Henry Kellogg, $4.99; Lieut. Walter Alexander, $2; Lady Georgiana Needham, $2.03; Lieut. W. L. Buck, $2; A. A. Jones, $2; W. E. Chase, $4; C. B. Whyte, $4; Samuel Goodsell, $2; J. Hornish, $2; P. O. Box, Keelville, Kansas, .20—Total, $25.22.

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THE

INTERNATIONAL STANDARD

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GREAT PYRAMID OF JEEZEH IN EGYPT

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All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 64 EUCLID AVENUE

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THE
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THE DRUIDS.

"Then God turned and gave them up to worship the host of Heaven."—Acts vii, 42.

Much has been written, and many a controversy waged, about the great stone monuments, temples, cromlechs, cairns, obelisks and tolmens, that stand in Britain and its isles. They are so like in form to some of those that rear their giant masses from the forests of Tartary and the plains of Arabia, to the jungles of Central America, that it is probable they had a like origin. They tell the faith of a people who were "scattered," of a nation who were "wanderers," and who, wherever they located, erected, according to their earliest customs, "standing images" as monuments of their belief, their traditions and their discoveries.

These standing images of Great Britain have been the most carefully studied. The contradictory statements, and the equally contradictory conclusions, place the student in the condition of a pendulum, between assertion and evidence; and if at last, in weariness, he "runs down," he finds in his bewilderment no relief from the restlessness of research. Very Athenians are the writers on this subject, for one says "one thing and one another." One gives the greatest of these remains—the well

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known Stonehenge—to the Romans. Dr. Stukeley writes a book entitled 'Stonehenge Restored to the Druids,' in full faith in their Druidicial origin. Ritson calls Stukeley a "ridiculous dreamer." One after another, antiquarians have measured and investigated; they have noted the positions of the stones; have theoretically restored the missing ones, and have formed and apparently proved the most contradictory conclusions. Among all, the weight of evidence is on the side of their having been erected—at, perhaps, different times—through the influence of a powerful and learned priesthood, known as Druidicial.

The stones have an actual and visible existence; the priesthood lives in tradition, and the memory of their doubly mixed worship in the names of localities, in the festivals and in the odd customs which have descended from the earliest times. By their "doubly mixed worship" I mean the worship of Jehovah and of Baal, of the one God and of the host of heaven, as well as their union of civil and religious power. This last gave an authority to the priesthood over both "souls and bodies of men" which made them almost invincible. What written history there is, we gain chiefly from the Welsh Triads and from what Julius Cæsar has left in his journals. The Triads were later but probably not less reliable. They tell us that the worship of the Druids was not solely a worship of heathenism, although heathen rites and fearful cruelties were mingled with it. It was a religion of civilization and of intelligence. The priests were the cultivated class, and if they had one faith for themselves and another for the worshipers, it was only what the greatest church organization in the world has had: Faith for the priests, sight for the people. The God for the initiated, His personified attributes for those whose unenlightened natures craved a visible deity.

But it is the works of these great priests that I propose now to examine. Before any satisfactory conclusions can be reached, the various theories must be weighed and measured and compared with such facts as we have. Patience and perseverance must be brought to the task; the very mysteries must be struggled with in the same spirit that sustained the novices who ventured to be initiated in the hidden wisdom of this ancient

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priesthood—the Chemarim of idolatrous Israel. They passed through darkness "in caves and caverns of the earth;" they groped in uncertainty, until at last, in the very abyss of despair, truth was evolved, and—relieved from the weight of doubt and error—the brave adventurer ascended joyfully to the full happiness of light and reward.

Among those who have sought the truth, the Rev. E. Duke has been the most signally recompensed. He has deduced a theory, tested it carefully and given the results in a book which reads like inspiration. His theory deals especially with the remains of Wiltshire, but is so thoroughly sustained that it is possible that it gives the clue to the elucidation of many more of these gigantic traces of a past civilization in all the lands where similar ruins are found. Before his theory can be appreciated, the reader must bear with a short description or review of some of the temples of which he speaks.

We will begin with Silsbury, or Silbury Hill, situated in the County of Wilts, in the southern part of England. The meaning of the name is "great or marvelous hill."

Of this hill Higgins says:

Silbury Hill is an artificial mound of such immense proportions and so deceitful in external appearance that I never could have believed its having stood upon so much ground had I not ascertained the fact by actual measurement. The learned Stukeley has in the description of this mound given reins to his fancy, which has so transported him beyond the region of truth, that he has stated "that some king was the founder of the temple of Abury (north of the hill), and that Silbury Hill was raised for his interment." His opinion is always ingenious, and therefore I lay it before my readers.

This theory I will omit, and as I have only notes from Stukeley before me, I will quote the description from Higgins' 'Celtic Druids.'

Silbury is a most astonishing collection of earth artificially raised, worthy of Abury. . . . . It stands exactly south of Abury, and exactly between the extremities of the two avenues, which, in the form of a snake, form the approaches to the temple. . . . . The circumference of the hill, or as near the base as possible, measured 2,027 feet; the diameter at the top 120 feet; the sloping height 316 feet, and the perpendicular height 170 feet; but that part of our measurement which will occasion the most surprise is, that this artificial hill covers the space of five acres and thirty-four perches of land.

Higgins then says:

For what purpose this huge pile of earth was raised, appears to be beyond the reach of conjecture, but I think there can be no doubt it was one of the component parts of the temple at Abury, not a sepulchral mound raised over the bones and ashes of a king or Arch Druid.

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In this description please note particularly that this mound is made of earth; this is an important element in Mr. Duke's theory. Immediately north of Silbury Hill, is the wonderful but well known and oft-described temple of Abury (Hebrew *Abiri*—potentes, or mighty ones). I will quote a part of a description of it, also through Higgins, from the 'History of Wiltshire,' by Sir R. Coalt Hoare:

The situation of Abury is finely chosen for its purpose, being the more elevated part of a plain, from which there is a descent every way. But as the religious work in Abury, though great in itself is but a part of the whole, the situation of the design is projected with great judgment, in a large plain four or five miles in diameter. The whole temple of Abury may be considered as a picture.

After long examination, Dr. Stukeley, from whom this is quoted by Sir R. C. Hoare, decided that the long lines of stone avenues represented a snake. He thought, "a snake transmitted through a circle. The head of the snake is carried up Hackpen Hill;" (*hac*—snake, *pen*—head. In Yorkshire snakes are yet called *hags*.) "The tail of the snake is conducted into the descending valley below Beckhampton. Thus our antiquity divides itself into three portions. The circle at Abury, the fore part of the snake leading toward Kennet; the hinder part leading toward Beckhampton—which I call avenues—to the great temple at Abury."

The temple, supposed to represent the body of the snake, is formed by a circular agger of earth, having its ditch within-side, contrary to the mode adopted in works of defense, and thereby proving it to be of a religious nature. The ramparts enclose an area of 1,400 feet in diameter, which on the edge nearest the ditch was set round with a row of rough, unhewn stones, and in the centre was ornamented with two circular temples. The space of ground enclosed within the vallum has been estimated by the Doctor at twenty-two acres. The outward circumvallation was computed at 4,800 feet. The number of stones that formed this outward circle was one hundred originally, of which, in A. D. 1722, there were eighteen standing and twenty-seven thrown down. Two concentric circles formed the temples, the outward in each consisting of thirty stones and the inward of twelve. The only difference which the Doctor could discover in these two temples was, that the one

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towards the south had a central obelisk, and the one towards the north a cove consisting of three large stones, placed with an obtuse angle towards each other. The central obelisk seems to have existed in Stukeley's time, for he states its being of a circular form at the base, and of vast bulk, twenty-one feet long, eight feet nine inches in diameter, and, when standing, higher than the rest. He further adds, that "exactly in the southern end of the line that connects the two centres of the temples is an old stone with a hole wrought in it." (I omit all the theories in regard to the various uses of these stones, as some of them are entirely disproved, and of the others, any student can choose between them). A note appended to a part of the description states that

Dr. Stukeley remarks that the meridian line passed through the centre of the grand circle, and of Silbury Hill, and on making our observation and allowing for the variation of the compass, we find it still does the same.

The more particular descriptions are so interesting that it is difficult to know what to omit, but as this article cannot be illustrated by explanatory plates, I will go back to Hackpen, the head of the snake, on the summit of Overton hill. The head was represented by a circle; it was formed of two concentric ovals, the longest diameters being east and west.

Of this Overton hill the country people have a high notion from time immemorial. It was a few years ago crowned with a most beautiful temple of the Druids. They called it the Sanctuary. It had suffered a good deal when I (Stukeley) took the prospect of it with great fidelity in 1723. Then Farmer Green took most of the stones away, and in 1724 Farmer Griffin ploughed half of it up, but the vacancy of every stone was most obvious, the hollow being still left fresh. In the winter of the same year the rest were carried away and the ground ploughed over.

Stukeley greatly laments the destruction of this beautiful temple, which was of proportions to be understood by all. He then describes the part of the snake which he designates as the tail. He speaks first of several of the stones which were known of by the neighbors, but which had been taken away for different purposes, some used in building, some in a causeway, some broken to get rid of them. He was, however, able to trace the line of the Serpent Avenue (Beckhampton), and carefully describes it, telling the names of those who destroyed the great stones of which it was formed. At last he comes near the end and says:

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Then it descends by the road to Cherill, till it comes to the Bath road, close to the Roman road, and there in a low valley it terminates near a fine group of barrows, under Cherill Hill, in the way to Oldbury Camp. This point, facing that group of barrows and looking up the hill, is a most solemn and awful place. A descent all the way from Longstone Cove, and directed to a descent farther down the Bath road, and where no less than five valleys meet, and in this very point only, you can see the temple on Overton Hill, on the south side of Silbury Hill. I am satisfied there was no temple or circle of stones at this end. I apprehend this end of the avenue grew narrower in imitation of the tail of a snake, and that one stone stood at the end by way of close.*

"This account," says Dr. R. C. Hoare, "must be our chief authority, for, excepting two of the stones which are supposed to form Longstone Cove, not one remains upright."

Of Longstone Cove, Dr. Stukeley says:

This Longstone Cove is composed of three stones, set upon the arc of a circle, regarding each other with an obtuse angle. This is set on the north side of the avenue, one of its stones forming the back of the cove. It stands midway, being on the fiftieth stone. It is placed on the highest ground over which the avenue passes.

The grand total of stones supposed to have been in the original work is 650; of which 400 form the avenue; 648 would probably be more correct as one of the avenue stones forms the back of the cove, the stones of which should therefore be given as *two* instead of three. The stone numbered as the tail of the snake is also doubtful. Of the total stones of the temple in Mr. Aubrey's time, A. D. 1663, only 73 weres tanding; in Dr. Stukeley's only 29; in Sir R. C. Hoare's, 1815, only 17. The delapidations have gone on rapidly since then; means of burning the stones have been found, so that ere long there will be but little left for antiquarians to theorize over. Perhaps their work is almost done.

Before leaving Abury I would suggest that the temple which stood on the body of the snake did not necessarily represent its body, nor was the snake necessarily transmitted through its circle. The temple may have represented something traveling on the snake. It was impossible to entirely separate Stukeley's description from his theories. He reflects thus upon this wonderful work:

This temple must have been the work of a great and learned people. The works evidence the genius of their founders. They have grandeur and symmetry in execution; in compass extensive, and in effect magnificent and agreeable. Never since creation was so magnificent an idea found in mortal minds as this stone hieroglyphic. The snake

*This statement has not been proved, the snake may have been partly represented, and ave been cut off abruptly.

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is three miles long, in proper proportions, its sinuosity well represented in huge curves running contrary ways, conducted over elevations and depressions. The plan of Abury was the circle and the snake. The Egyptians add wings.—('Stonehenge Restored to the Druids,' p. 49.)

Of some of the other temples included by Mr. Duke, I have been unable to find descriptions in time to add them to this article. We will therefore consider Stonehenge, as in that he finds the most significance.

Different meanings are given for the word; "hanging stones" is generally accepted, but the one which best agrees with Mr. Duke is that which defines the Welsh name for Stonhenge—Gwaith Emrys, or Emreis—"the structure of the revolution." Mr. Duke does not seem to have noticed this meaning, or I may have failed to see that he did so, but its appropriateness will be evident, in fact, it adds greatly to his idea.

Here it will be well to note the three great works of which the Triads tell us: 1. The lifting of the stone of Ketti. 2. The building the work of Mmyrs. 3. The piling up the mount of assemblies.

In describing Stonehenge I will quote from Stukeley, Hoare and Higgins. On Salisbury plain are still standing 94 of the great stones which formed the "proudest singularity" (Stukeley) of all the Druidicial temples of Britain. It is "surrounded by a ditch and slight agger of earth" (Hoare). The ditch being within the vallum distinguishes it, as this peculiarty does Abury, from a military work. "There is but one entrance into the arc; this faces the northeast, and is marked by a bank and ditch called the avenue. The first object which arrests one's attention is a large rude stone, called the 'Friar's Heel;' it is about 16 feet in height. We now enter the area of the works, having the bank and ditch on our right and left. Adjoining the agger, within the area, is a large prostrate stone . . . bearing the same mark of tools as the large uprights of the temple. This stone measures 21 feet 2 inches in length, of which 3 feet 6 inches being under ground, the height when upright was 17 feet 8 inches. The distance from the first stone in the avenue to second stone at the entrance of the area was about 100 feet, and the distance between that and the outside of the stone

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circle nearly the same. There are two small stones within the vallum, one 9 feet high and the other 4."—(Hoare).

As the descriptions are of plates it is difficult to select such as will give a clear idea of the temple, but probably all our readers have a general knowledge of those grand ruins, standing in solemn majesty on Salisbury plain. It will only be necessary to give some measurements and statements before quoting Mr. Duke.

"The temple consists of two circles and two ovals. The outward circle, about 300 feet in circumference, is composed of huge upright stones bearing others over them, which form a kind of architrave." These are curiously mortised into the upright stones. "This circle consisted originally of 30 stones, of which 17 are still standing. They are about 13 feet high, and from 6 to 7 wide. The grandest part of the temple is the cell or sanctum. This inner temple represents two-thirds of a large oval and a concomitant small oval; as in the outward temple, we find a large and small circle. The large oval is formed of five pair of trilithons, or two large upright stones with a third laid over them." These trilithons rise gradually as they approach the altar, or the stone so-called, measuring from 16 feet to 21 feet 6 inches. "The inner oval consisted, according to Stukeley, of 19 stones; they are smoother and smaller than those of the inner circle of small stones, and incline to the pyramidal form. One stone deserves notice from having a groove cut all down it, and it bevels off almost to an angle on the inner side. The inside diameter of this whole building is about 100 feet" (the number 100 was a favorite one with these builders, as also the number 4, which was to the Druids a mystic number); "the width of the entrance into the cell from the trilithons on each side is 43 feet."—Hoare.

They that were within, when it was in perfection, would see a most notable effect produced by the elliptical figure, included in a central corona, having the large hemisphere of the heaven for its covering. . . . The walk between the two circles, which is three hundred feet in circumference, is very noble and delightful. . . . The intent of the founders of Stonehenge was to set the entrance full northeast, being the farthest elongation of our celestial luminary northward.—(Stukeley, in 'Stonehenge Restored to the Druids.')

He also says the meridian line passes directly through the

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Cursus, and that by calculation on the variation of the compass he ascribes the building to 460 B. C.

The stones used are not all alike. Some of them are of a kind called Sarsen, which, Dr. Stukely says, is a Phœnician word and means rock. Their immense size and weight has been the cause of another set of theories in regard to their transportation. One of the stones is said to weigh seventy tons, and to move such stones requires a mixture of intelligence with strength that can only be obtained by the employment of a number of human beings. Reason is the strongest mechanical power. It was brought to bear on the transportation of what is said to be the heaviest stone ever moved, that upon which stands the equestrian statute of Peter the Great, in St. Petersburg. Several thousand men were harnessed to the stone; the king and his court were present; banners were waved and martial music directed the movements; one great combined movement raised the end of the stone upon a roller and success was assured. "Now," says a writer in *Harper's*, who describes this, "if we add to such power as this the animation of that religious faith that can remove mountains, the building of the Stonehenge and other great temples ceases to be a mystery." The same writer says that an antiquarian who visited the place with Emerson, "divided the stones into astronomical and sacrificial, and placing the philosopher upon one of the latter, pointed him to an astronomical, and bade him notice that its top ranged with the sky line, which being conceded he stated that at the summer solstice the sun rises exactly over the top of that stone, and at the Druidical Temple at Abury there is a stone in the same relative position."

After some comparison of Stonehenge with a "very similar stone temple in the heart of a forest discovered in Tartary," he says:

> The stone, sixteen feet high, and about two hundred yards from the temple, called the Friar's Heel, is not only set exactly at that point, toward the northeast, where the sun rises at the summer solstice exactly over its top, but has been set in a place where the ground has been scooped so as to bring its top, as seen from the altar, precisely against the horizon. It is thus plainly an astronomical stone. Every year people go out on the twenty-first of June to see the sun rise above this stone, and that it does with absolute exactness admits now of no question.

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That the builders of these temples worshipped the heavenly bodies is generally conceded. Stukeley's researches show they reverenced the circle and the oval, and that in some way the serpent was connected with their religious observances, and that in the barrows surrounding the temples, those who were buried were placed with their heads to the north.

A philosopher and astronomer, by the name of Waltire, thought this structure was erected for making observations on the heavenly bodies, and that the surrounding tumuli or barrows accurately represented the situation and magnitude of the fixed stars, forming a complete and perfect planisphere. He thought he traced 1,500; he also thought some of the barrows registered certain eclipses, and that the trilithons are registers of the transits of Mercury and Venus. He seems to have a glimpse of the grand theory of Mr. Duke, which combines all the astronomical knowledge that has been conceded to these ancient philosophers.

The outline of this theory can be given in a few words. Mr. Duke considers that this system of Wiltshire Temples represents a gigantic orrery, which includes the sun and moon and the planets then known, all of which were supposed to revolve around the earth. He also discovered the magnificent belief in the Magnus Annus, that great year of years which would restore the heavenly orbs to their original starting point, and during which the Mundane Egg would arrive at perfection and burst into new beauty and true life. He calls Stonehenge the Temple of Saturn, for reasons which are faintly shadowed forth in traditions which I have found wherever I have discovered any especial worship of Saturn as planet or as god. I will give some of them before quoting Mr. Duke's own words. Saturn is familiar to us mythologically as a son of Cœlus (the heaven) as father of Time, and represented as an old man with a scythe, and with a circle formed of a serpent holding his tail in his mouth, and who devoured his children (the years) as soon as they were born. This Saturn, with the strange glimpses of truth that make mythology a history of religious thought, reigned during a typical golden age, when liberty was proclaimed on earth. All this was represented in the Roman Sat-

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urnalia, a feast also observed by the Druids, and when priests made their offerings with uncovered heads.

"Every thirtieth year," says John Smith, in his 'Gallic Antiquities,' "the Druids held a festival in honor of Saturn when he entered the constellation of Taurus."

Saturn was also known as the "Sabbath Star" of Israel, and the Canaanites considered that the spirit of the planet Saturn dwelt in their hideous conception of Moloch.

In Macrobius (quoted by Stukeley in 'Stonehenge Restored to the Druids,' p 39) mention is made of a famous round temple in Thrace, which, from the description, seems something like our Stonehenge, it was sacred to Sabazius, which may be a corruption of Sabbaoth. When the rites of Bacchus were performed they called Evohe Sabbai, undoubtedly Jehovah Sabbaoth.

Saturn in Hebrew is Sabbatei, and means *resting;* in Arabic it is Refan, also *resting;* in Coptic, Refan or Remphan, *restoring*, which reminds us of the verse from which the heading of this article is taken: "Then God gave them up to worship the host of heaven. Yea, ye took up the Tabernacle of Moloch, and the star of your god Remphan."

In Mazzaroth the following passage bears upon the subject, as it gives the order in which the planets composing this stone orrery were probably discovered (Third Part, p. 2):

If man was created when the sun was quitting Leo for Virgo, *Mars*, if in Aries would be very bright, and its motion soonest perceptible, the first luminary discovered to be a planet. If *Mercury* were in Virgo, it would be perceptible for a while in the evening twilight and then disappearing, prove itself to be a planet. *Jupiter* in Saggitarius would be splendid in the midnight sky. *Venus* in Libra towards the morning, and *Saturn* (Sabbatei, the star of the rest), perhaps first discovered near Jupiter in the midnight on the Sabbath, distinguished as a planet by its pale orb. These signs are called in astrological tradition the "houses of the planets." If they were first observed in them, a reason for this may be given for which none other has ever been alleged. The succession of the planetary names of the days of the week may be accounted for by the planets having first been recognized in that order.

In a note on Leo, it is stated from Macrobius that the Egyptian astronomers thought that at the creation, the sun rose in Leo and the moon in Cancer. Julius Africanus gives the same testimony.

According to Herschell "the surest and best characteristic of a well founded induction is when verifications of it spring up, as it were spontaneously, from quarters where they might be least expected, or from those which were considered hostile.

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Evidence of this kind is irresistible." And such evidence springs up on every side of this subject, so that the wonder grows that we have not always known and believed what it now seems impossible to doubt.

Who but a people who, in their national childhood, knew Jehovah as their King and His revelations as their household words, who turned reverently to the orbs of heaven as His teachers to them of signs and seasons and days and years, could have conceived of a work like this? Who but such a people, even though they had perverted their early faith and made gods of the heavenly hosts, whose order and regularity of movement almost asserted a divinity—who but they could have impressed every nation with records of the truth, and reared such monuments as those of Wiltshire to tell the story of their faith, and the reason of their dispersion? "Oh Israel, thou hast destroyed thyself—return unto the Lord thy God, for thou hast fallen by their iniquity." "Israel hath increased the altars and made standing images, . . hath forgotton his Maker, and builded temples, and . . . worshipped the host of heaven."

But this may be called "assertion." Perhaps Mr. Duke's own words may give us "evidence." He says:

The ancients held that at the close of an immense period of years, all the heavenly bodies would arrive at the same place from which they started. This doctrine is called the Platonic Cycle, though not invented by Plato, but adopted by him. This is synchronous with the precession of the equinoxes described by Higgins ('Celtic Druids,' p. 149). It is certain the ancients observed this precession or recession of the equinoxes, and considered that in process of time all the heavenly bodies would revert to their original stations and a new world begin. Macrobius fixes its period at 15,000 years; some say 49,000; more modern astronomers say 24,800, 25,816, 25,920. My opinion—that this majestic and stationary orrery was denotive of this cycle of cycles—is borne out by reference to the Temple of Saturn, the modern Stonehenge. Here, in the centre, is an area beautifully assuming the form of an egg, and caused by the ecliptical location of the seven trilithons, the representations of the planets. This, with Smith, I regard as denotive of the *ovum mundi* of universal nature.

Smith did not recognize Stonehenge as the Temple of Saturn. But how the truth unfolds! Here within the only one of the series of temples in which it could be placed, in the inmost recess of the Temple of Saturn, whose orbit was held to include all time and space, surrounded by the representatives of the planets, was mystically placed the Mundane Egg, the germ of universal nature, receiving during the term of this cycle of cycles, the daily influence of the rays of the Sun, until the lengthened period of incubation passed, the old world shall cease to exist, and the new, spring into being. A more beautiful allegory, a more expressive emblem was never devised by mind of man or practically illustrated by the operation of his hand.

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In the great orrery or terrestrial diagram, a tumulus of earth on Silsbury Hill represents the Earth. This seems not to have been a temple; this circumstance, that Silsbury Hill does not develop as a religious temple leaves it admirably adapted as the Earth, the centre of this mundane system. If I leave this representation of the Earth, and proceed northward, I arrive at two stone circular temples, surrounded by a cycle of one hundred stones, and the whole enclosed in a fosse; to my surprise I find this called Abury (Hebrew, *Abiri* —potentes, or the mighty ones) evidently allusive to these two temples as representations of the Sun and Moon, the chief deities in the planetary worship. I find these temples set in varied forms, and in their several details referable to astronomical cycles. Temple of the Sun contains the cycles of days of month, months of year, and a single stone to denote the entire year. Temple of the Moon, the cycles of days of month, months of year, and of early tripartite division of seasons.

The southern temple is that of the Sun, for a stone (stands in it) evidently a gnomon, from its exact location to take observations of the rise of the Sun, at the winter solstice. Stonehenge has the same for the summer solstice. Now connect with Silsbury Hill these temples bounded by their cirque of one hundred stones. They are located on the central portion of an immense curved serpent, whose bow is towards the south, and whose half surrounds Silsbury Hill. Here I, in this serpent, recognize a portion of the ecliptic. The ancients represent the ecliptic as a serpent; the Sun and Moon ranging around the Earth as the centre of the universe.

Three miles south of the Earth I find the Temple of Mercury. Near it is Knap Hill, which suggests Egyptian Kneph—Mercury.

Four miles north of the Earth I find another temple, which study induces me to ascribe to Venus.

Three miles from Mercury I find an immense mound, supposed to be a religious temple, traditionally ascribed to Mars, situated at Marsden (*mars* and *den*—a cave or residence).

Pursuing my pilgrimage on the meridional line three miles, I find another temple, which I assign to Jupiter; from which, four miles on the meridional line to a tumulus of observation, I see the temples of Jupiter and Saturn. Three miles down a slope brings me to Saturn—Stonehenge. This temple fronts the northeast, and is erected with reference to the summer solstice.

From the stones I learn they speak the cycle of the years of Saturn, or the emblem of the race of man, thirty stones on thirty uprights; the cycle of the planets, and the Metonic cycle of nineteen years.

That the so-called "altar stone" could not have been used for such a purpose, from the fact that it reduces to powder under the action of fire. It is a station of astronomical observation. A man stationed on it on the day of the summer solstice could see the sun rise behind the apex of the gnomon in the distance, and then gloriously proceed on its way.

For the intensely interesting astronomical description which follows, I must refer the reader to Mr. Duke's book, 'The Druidical Remains of the County of Wilts,' by the Rev. E. Duke. London, 1846.

It was in my possession only a few hours—only long enough to gain these few suggestions of its interest. After summing up the wonders and developments of his discoveries he says:

Unite the whole, and find that great asrronomical scheme typifying the Magnus Annus, the Cycle of the World.

Before leaving the subject it will not be irrelevant to propose

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an explanation, suggested by his theory, of the Egyptian hieroglyphic—the winged globe and serpents. Among its meanings —for in both mysteries and prophecies there are many—may not the first and simplest have been a representation of the Sun flying on its course, with outspread wings, while its circular path was represented by two serpents, the better to explain its northern and southern flight.

This emblem, Dr. Stukeley thinks, was represented at Abury, although he gives a very different signification. His may be correct, but that the Egytian emblem primarily meant the Sun "rejoicing as a strong man to run his course," is proved by their fable of the Phœnix, which, after a flight of six hundred and fifty-one years, was burned to ashes in the concentrated rays of the Sun, represented on the roof of one of their temples. An egg was developed from its ashes, and a new bird rushes on its tireless round. This was the planet Mercury and its transit over the Sun's disc, where it disappeared, as if consumed by its fiery heat, reappearing again after its passage as if in renewed life.

These transits Waltire supposed were recorded at Stonehenge, adding another to the "verifications"—for the wisdom of the Egyptians, as well as their idolatries, as one of the strong influences in the formation of the Israelitish national character.

E. Bedell Benjamin.

[*To be Continued.*]

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THE MEASURES AND WEIGHTS MENTIONED IN THE BIBLE, IN CONNECTION WITH STRUCTURES, WORSHIP AND NARRATIVES.

In proposing to myself to do this work, I am encouraged mainly by my knowledge of the original languages of the Bible, as well as with their dialects. But this is not the only qualification necessary for this work. A facile handling of mathematics is equally as necessary for this work, in which, however, I am regretfully conscious to be lacking. Yet the work must be done, and in a way free, on the one hand, from those preconceived notions which are engendered so frequently by an undue reverence for traditional translations and interpretations, and, on the other hand, free also from fond fancies which one may become inclined to interpret rather into the original than interpret the sound sense from them. The Christianly reverent spirit of both the contributors and readers of this Magazine, the high scientific attainments of some of them, and the free spirit which pervades the valuable articles in it, encourage me to put my work on record in it, fondly hoping for the needed mathematical and other help from its readers and contributors. Not claiming any arrogant infallibility, I desire, on the contrary, and solicit just criticism as an aid in this work, so that it may ultimate in, at least, an approach to the truth, which I and others are, I trust, always in quest of.

I propose to take up every place in the Bible where direct statements or passing illusions are made of weights and measures, and so far as necessary discuss the objects which are weighed and measured. The latter work, although not altogether belonging to the general object of this Magazine, is yet necessary in order to correct frequent current mistranslations and interpretations, which may as well find here as anywhere else a recording resting place.

(I.) Noah's Ark.—The first mention of measures in the Bible we find in connection with Noah's Ark. (1.) The name of

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this structure in the original is $T_{ae}B_oH$,*and is found in two places only in the Old Testament, viz: here and in connection with the exposing of the infant Moses on the waters of the Nile. (Exodus ii, 3–5.) There is no Hebrew word as a verb from which this noun might be derived, nor is there a verb which might be derived from this noun. From its use in the two narratives the word evidently denotes a hollow, covered vessel, designed for the safe keeping of living beings against damage by water, on which it is made to float. That this Ark of Noah's was not an ordinary open ship is evident from (*a*). That neither one of the Hebrew words for ship (which are $SFI_iN_oH_iA_oN_iI$, or $A_oN_iI_oH_i$† and TS_iI) are used here, and (*b*) that special provision is here made for a top light, which admitted air also, and which implies, of course, that the structure was covered by a roof, and lastly (*c*), that it had a side door and hence no open deck. (Compare Genesis vi, 16 and viii, 6.) The word in vi, 16, $TS_{on}H_aR$, which specifies the arrangement for light and air, gave translators and interpreters most trouble. This word occurs in the singular, only this one time in the Old Testament, while it frequently occurs in the dual number $TS_oH_aR_oI_iM$, in which number it denotes the light of the sun at high noon, when he stands directly over our heads. This established meaning in the dual number should have been sufficient to lead Bible scholars to take the word in the singular as denoting simply light that comes from the top.

Now, let the reader bear in mind the following points: (1.) That Noah made a window in the Ark, which he used for observing the state of things outside of it, (viii, 6), and that this window was not mentioned in his specifications. The Hebrew word for this window is $HH_aLV_{ou}N$, and is used for an opening made in a wall of a house for the purposes of light and out-

*I shall write Hebrew words in capital consonants, as they are in the original, and the vowels beneath in small letters. I prefer to use the original Hebrew word for this vessel, and would rather transcribe than translate it, because no adequate word in the English offers itself for the purpose. The consonantal root T. B. of this word is seen in the Greek "Tibae," and in the Teutonic words "boot," "boat" and "bateau."

†The original Hebrew had no vowels, and as such letters as A and I are consonants, and can be articulated then only when a vowel is added to them, Ao is, therefore, equivalent to our O, and Io equals yo, etc., etc.

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look. (2.) That Noah made a covering on the Ark, which was also not in specifications. (viii, 13). (3.) The indications of the Ark were not merely to protect a large number of animals from drowning, but also to shelter them from a forty days' and nights' rain of unprecedented severity, which, had it been allowed to fall into the Ark, would have drowned both them and the Noah family in the very Ark which was meant for their safety. Then, there was need also of keeping an enormous amount of food for the animals from spoiling by the rain. The room for both animals and their food offered no difficulty to Noah, and neither does it now to us, who know of the Great Eastern's dimensions, and its perfect safety even on the stormy Atlantic. The great difficulty which did present itself to Noah must have been to provide light, which must have been indispensable for a proper attendance upon the animals, and also sufficient air for proper ventilation, and to do this without letting the rain come in. Bearing these points in mind, the reader will see from the following translation and short comments how nicely all the indications were met by the divine specifications of the structure:

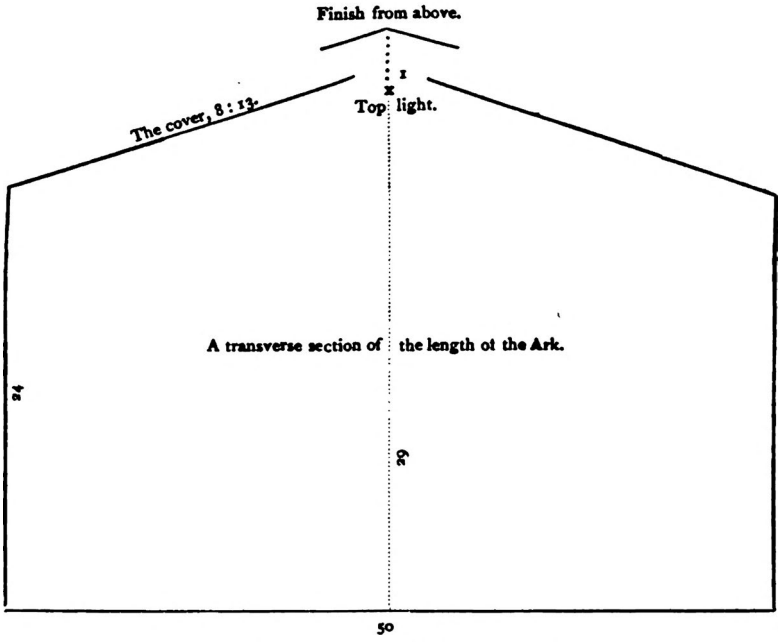
(Genesis vi, 14-16.) Make unto thee a Teva of Cypress planks. Make the Teva in stalls, and rosin it from the inside and outside with rosin. (15) And these are (the dimensions) that thou shalt make it: three hundred A_aM_oH the length of the Teva, fifty $A_a^1M_oH$ its width, and thirty A_aM_oH its height (16). A top-light shalt thou make for the Teva, and at an A_aM_oH from above it (the top-light) thou shalt finish it (the Teva); and the door of the Teva thou shalt put in the side of it, lowermost ones, second ones and third ones shalt thou make it.

COMMENTS.—The Cypress wood and rosin were excellent means of disinfection. For the rain to shed well, the roof, or cover, of which we read in viii., 13, must, of course, have been a slanting one. But what was the pitch? Answer.—A Teva had a roof, and this Teva had to have a slanting one. The 30 A_aM_oH height must therefore refer to the perpendicular from bottom to the comb. But of this height 1 A_aM_oH was to go off for the covering up of the top-light, so that the main roof

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stopped at the level of 29 A_aM_oH of the perpendicular, and left an opening, which was the top-light, the width of which is not specified. Then this opening was covered by the remaining part of the roof, only raised 1 A_aM_oH from the level of the opening, and having the slanting sides descending over the main roof down far enough to prevent the washing of the rain backwards into the Teva. The distance between the overlaping slants of the two roofs is, of course, determined by the specified 1 A_aM_oH height of the upper roof. This arrangement must have met all the indications of light and air, since the opening was the whole length of the Teva, viz.: 300 A_aM_oH, while its width was left to the judgment of the builders. The angle, however, which the inclines of the main roof made with the walls of the Teva would have to be determined by the height of these walls, which were not 30 A_aM_oH, since the specifications speak of finishing the Teva 1 A_aM_oH from above. Now, the respective heights of the specified three tiers of stalls were not specified, but were left to the good judgment of Noah. Let us, therefore, assume, merely for the sake of illustration, that Noah divided the 30 A_aM_oH height of the Teva in five parts, and allowed four parts, 24 A_aM_oH, for the three tiers, and also for a deck with bulwarks; then there would have been left 6 A_aM_oH for the roof. Of these Noah could have taken 5 A_aM_oH for the perpendicular side of the rectangular triangle, and 25 A_aM_oH (half the width of the Teva) for the horizontal side of the same, and these sides would have determined for him the incline of the hypothenuse (the slant) and its angle with the wall. Then, having determined upon where to stop the roof for the top-light, he could have calculated the proportions of the upper roof. The accompanying figure will show the reader what I have endeavored to explain.

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I cannot forbear calling the reader's attention to the remarkable words in Genesis vii, 16: "And Yahooh (English, Jehovah) closed up in his (Noah's) stead." Noah was not on the outside to make the door water-tight. The righteous master mechanic was safely secured by his divine teacher. What analogy is here with the closing up of the Great Pyramid? Did Noah know something of what we call geometry? Did he know anything of the law of the hypothenuse, the so-called forty-seventh of Euclid? Let better mathematicians than I am answer. I am only a linguist and stand good for my work only, which is, not to add or take away from what "thus it is written."

(II.) The cubit, the Hebrew A_aM_oH.—In all languages we find nouns derived from verbs, and verbs from nouns. The question is useless as to which was first conceived by the human mind; it is, and ever was capable of conceiving and naming the one as well as the other. The Hebrew word A_aM_oH, or as it is traditionally and correctly pointed to be pronounced A'_aMM_oH, is usually derived by lexicographers from a supposed verbal root

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of the two letters A M, to which they give the supposed meaning of "gathering-in-one." And since this A_aM_oH is applied in Hebrew to a perpendicular standing on a horizontal, therefore, it is said, it applies to the elbow joint, and then to the forearm as a measure, hence the Latin *cubitus*. But there is no such verb-root A M in any semitic, at least not in the Hebrew language. We find, however, that the two lettered word AM, when traditionally pronounced $A_{ae}M$, means "mother." And again we find that when an H is added to AM and traditionally pronounced A_oM_oH it means then "female servant." And again, when these last three consonants are traditionally pronounced $A_{oo}M_oH$, then it means "nation." Now, it does not strike me as probable that all these diverse ideas of "gathering-in-one," "ell" (cubit), "mother," "female servant" and "nation" should be derived from that one root "AM." It is my linguistic conviction, growing out from comparing words in some twelve different Semitic and Aryan languages, that the fond notion, entertained yet by some, that the Hebrew is a primitive language is not true. That all languages sprung from one primitive one is a conviction which I share with all extensive linguists, and so far confirms my faith in part of the sacred story about the unity of language among the descendants of Noah. But as to that part of the story which refers to the origin of the diversity of languages, I think linguists do not rightfully consider it. They proceed in their investigation on the assumption that that diversity originated from normal physiological and psychological laws, and in this way account for the permutations of some sounds and the suppression of others in different languages and dialects. They speak of Euphony and Cakophony as normalities, where there is in reality an actual inability to pronounce certain sounds. Thus the Greek is actually unable to pronounce the sh sound, and he can only pronounce the s sound; the present English (not the Scotch) cannot pronounce the gutteral ch; the Sclav cannot pronounce the th sound; the Chinese cannot pronounce the r sound, etc., etc., etc. Now, all these inabilities are not physiologically normal but pathologically abnormal. And here is, it seems to me, the key by which to unlock the mystery of the diversity of all languages,

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which are, after all, derivable from one primitive one. It is true that when a pathological state is once established in an organism, it then proceeds to grow and develop according to certain laws of its own, and the propagation of other pathological organisms from it is not hindered. But all these do not make a pathology a physiology. It cannot be successfully maintained that a pathological state is merely an evolution of an opposite physiological state; such a genesis cannot be shown and the law of "like produces like" must be true. But how, then, does ever a pathological state begin? The only answer to this is: By a catastrophe from without and not by an evolution from within. This I take to be as true in language as it is in all living organisms. There must, therefore, I conclude, have been a fatal catastrophe in the history of the human organism, which produced a pathological state in both the human organs of speech and hearing. And since we know that fright may produce such a sudden shock upon the human nervous system as to cause total speechlessness, hence the supposition is natural that fright was the cause of the diversity of languages, in which we can yet trace their unity; and the sacred story about the confusion of languages points in that direction. It remains yet for some competent hand to write "The Pathology of Human Languages, Based Upon the Pathology of Living Organisms." But the Hebrew language, even if it should have been the primitive one, was no exception to that catastrophic event recorded in the very Hebrew scriptures. I, therefore, conclude that the roots of many Hebrew words are to be found purer and fuller in other languages, Aryan as well as Semitic.

It is thus that I explain to myself the origin of the Hebrew $A_{ae}M$, which means "mother." I regard it as a pathological result of the primitive root, consisting of the Semitic Ain and Mem, which means "nation." That Ain is a compound of "G" hard and HH—ch German. None of the Semitic surviving tribes, except the Arabs, have preserved its primitive pronunciation, and the Aryan tribes have substituted for it the F sound, in the same way as the English write "cough," and pronounce the word "couf". The present Jews (except the Spanish and Portuguese, who make of it an absurd nasal sound) flatten the

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Ain to a mere Alef. All these corruptions are not physiological but pathological. Of this GHHM, arose the FM root of the Italian tribes, from which we have *femina*, *famula*, *famulus*, and *familia*. And this formation of the idea and word *familia* from *femina*, or from its primitive root FM, which means "female servant," finds its counterpart in Hebrew usage, where from the word Sh_iHH_oH, which means also "female servant," is from the idea and word $M_iShP_oHH_oH$, meaning "family." There came a time when the woman became no longer the wife of the one husband, but the mere slave and breeder of progeny, which was called after her. Some tribe of the sons of Eber were unable to pronounce the Ain (G_+HH) sound, and flattened it down to a mere Alef sound, and thus became the Hebrew $A_{ae}M$—"mother." Then adding an H and changing the vowel of the A and giving a vowel to the M, the word A_oM_oH was found, which means "female servant." And again changing the vowel of the A there was formed the $A_{oo}M_oH$, which means "nation." I conclude, therefore, that the two-lettered primitive root AM has nothing to do with the word A_aM_oh, which means "ell" or "cubit." The root of this word is not to be found in the Semitic, but in the Aryan languages, viz.: in the Greek "OOlenæ," and in the Latin "ulna," the root of which is OLN. Now the reader will remember that sounds pronounced by the same organs are permuted one for another in different, and even in the same, languages, and that the same is the case with the so-called liquid sounds LMN, and also R when it is rolled with the anterior part of the tongue, and not pronounced gutturally, in the Parisian fashion. The sounds B, V, M, P, F, being labials and labio-dentals, are permuted. Hence we find in the Chaldee ALV for OLN, from which is formed the word A_aLV_oH, by which the Hebrew A_aM_oH is translated in Isaiah vi., 4. And the Hebrew root of this last word is AMM, which last two Ms are the result first of the permutation of N into M, and then of assimilation and absorption of this M into the L, which is also permuted into M, so that the primitive OLN or A_oLN became in Hebrew A_aMM, and then A_aM. The evidence for this is, (1) in the traditional pronunciation of A_aM_oH as A_aMM_oH. (The H is only the sign of the

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feminine, like the "æ" in the Greek "OOlenæ," and the "a" in the Latin "ulna.") The persistency of doubling the consonant of this word in other Aryan languages is remarkable, so in Anglo-Saxon, "Eln;" Dutch, "Ell," and "Elle;" German, "Elle," "Elna;" Gothic, "Aleina;" Icelandic, "Alin;" Danish, "Alen;" Swedish, "Aln." The variety of vowels inserted between these two consonants in some of these languages has nothing to do with the root. (2.) Another remarkable evidence that this Hebrew A_aM_oH is from the root ALN, or OLN, and not from the usually theorized root AM, is seen in the fact that in the eighty-three times when this word occurs in the Old Testament in the plural it is, without a single exception, written $A_aMV_{ou}Th$, while the plural of $A_{ae}M$ (mother) is invariably written $A_{ee}M_oTh$ without a V; and so, too, the plural of A_oM_oH (female servant) is, with only two exceptions, both in the same narrative (II. Samuel vi, 20–22), written without a V. This persistent V, I regard as a permutation of the second M in A_aMM_oH, which is assimilated and absorbed in the singular, while in the plural of $A_{ee}M_{ou}Th$ (mothers), and $A_aMH_{ou}Th$ (female servants), there was no second M in the root to permute. I know right well that the crowd of Hebrew grammarians regard this presence or absence of the V in the plural as a mere matter of orthographic variety, but so much the worse for these grammarians. I presume also, I must further say here, that some of our American professors of Hebrew would smile quite contemptuously on reading this my original investigation, and would self-complacently knock it all into a pi by that unanswerable argument of old. Why did not any of *our* scribes say such a thing before? But this does not affect me, since I know that there is no ancient Hebrew literature outside of the Old Testament, and I feel myself as much authorized to construct a grammar and lexicon of the Hebrew from this, as any one of those who not only followed each other, but even stepped in the very footprints of each other. *Original* Hebraists are very few yet in this country, and these will perhaps appreciate my labors in these and other writings. But *ad rem.* The diversity of languages results not only from pathological permutations, and also transposition of letters in words, but also from the appli-

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cation of one and the same word to different parts of the animal and human body. So do the Latin and Greek apply the root BRCp in *Brachium* both to the elbow joint and to the forearm, while the Hebrew applies it to the knee exclusively, viz: B_eR_eCh. The Greek and Latin use the root OM to denote shoulder and also entire upper extremity, in the words *hoomos*, *humerus* (also Teutonic "arm") while the Hebrew applies it to the forearm alone, in the word A_aM_oH, derived from OLN, and has a separate word, Ih_eCh_eM, for shoulder (from which the German "schenkel" and English "shank") and another, ZR_oGHH_aH for "arm." Were it not that the Hebrew A_aM_oH is invariably translated "Pæchos" in Greek, the measure of which we know more or less, we would not know whether the word meant the length of the entire upper extremity, or only of the forearm and hand, and this Greek "Pæchos" is related to the Hebrew T_eF_aHH, commonly translated "span," and which I shall examine when I come to discuss this measure and its relation to the A_aM_oH. It remains for me yet to refer the reader of this paper to certain passages in the Old Testament to which Hebrew lexicographers refer in connection with this word A_aM_oH:

(1.) In 2 Samuel, viii., 1, is neither a place called Metheg Ammeh, nor does it mean "the bridle of Ammah," as given in the margin of the common version. The second word is simply wrong voweled by the Jewish authorities, and should be voweled $A_{oo}M_oH$ and read "OOmoh." There is a keen thrust against the Philistines in this verse, by implying that they were governed like asses by a bit in the mouth, according to the saying in Proverbs xxvi., 3, "A switch for the horse (whom the true Oriental guides by a mere string in the mouth) a bit for (the stubborn) ass, and a rod for the back of fools." The entire passage in Samuel reads thus: "And it became after this, that David smote the Philistines and humiliated them; and David took the bit of the nation ($A_{oo}M_oH$) from the hand of the Philistines;" *i. e.*, took the reins of the government from their hands.

(2.) In Deuteronomy, iii, 11, "the A_oMM_oH of a man" does not refer to any exact measure, but to the approximative

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domestic measure from the elbow to the longest, or some other finger.

(3.) In Isaiah, vi, 4, "the $A_aMV_{ou}Th$ of the thresholds" means the posts of the door openings as they are let into the sockets of the thresholds, as the forearm is in the elbow joint. In a similar way, but using another part of the human body, does the English architect speak of the "jambs" of a door or window from the French "jambe"—a leg, a foot.

In concluding this paper I beg the reader to pardon its lengthiness and perhaps resultlessness, since all I have said did not bring us the knowledge of the true length of the A_aM_oH = cubit = ell. It frequently happens that we find something we did not set out for when we search thoroughly and honestly for something else. Most frequently did this happen to me when searching in that wonderful store of antiquity, our dear old Bible.

EPH. M. EPSTEIN, M. D.

Vermillion, D. T., February 7, 1885.

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THE ALTAR AND PILLAR TO JEHOVAH.

IX.

The reader is requested to bear in mind that the object of this first division of our subject, "The Altar to Jehovah," is simply to show that the Great Pyramid was truly an altar—in its battlemented condition an altar of self-sacrifice, and in its finished or tombic condition a memorial altar, or altar of witness—and that whatever is said respecting the builder of it is incidental, being involved in the exposition of passages of Scripture touching the utilitarian objects of its construction. The Scripture at present under consideration is Jehovah's address to Shebna in the twenty-second chapter of Isaiah, beginning with a clear proof of the convertibility of a treasure-stronghold into a monumental tomb. Having considered some of the reasons for believing that the person with whom Shebna is compared was Joseph, and that his "sepulcher on high" was the king's chamber in the Great Pyramid, it is now in order to enquire what is meant by

(9) *His Habitation in a Rock.* A sepulcher for the dead and a habitation for the living are in a manner the correlatives of each other; and if the "sepulcher on high" was the cavern-like king's chamber, with its empty sarcophagus, it is natural to suppose that the correlative "habitation in a rock" was the cottage-like queen's chamber, with its empty niche. The only incongruity in this supposition is that the relation of the sepulcher for the dead to the habitation for the living, in respect to altitude, is the reverse of what is customary and seemingly proper; but this reversal of one of our most ordinary ideas of the fitness of things is to be explained by whatever adequate reason can be assigned for the half-finished condition of the subterranean chamber, showing, as it does, an abandonment of the use for which that chamber was intended, and a transfer of this use to the king's chamber, as indicated by the presence of the

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granite sarcophagus in this chamber rather than in that. To any one who believes in the inspirational character of the Great Pyramid, the explanation of this anomaly very readily suggests itself. It is simply that the transfer was made, and that the sepulcher for the dead was exalted above the habitation for the living, by a man inspired with the grand truth of his own resurrection from the dead, as well as that of the patriarchs before him, through faith in the promised Redeemer, who said before his crucifixion, as truly as he says still, "I am the resurrection and the life; he that believeth on me, though he die, yet shall he live: and whosoever liveth and believeth on me shall never die."

A habitation for the living may also, I think, be very properly assigned to a life-like statue of the inhabitant, such as "the diorite statue," traditioned to have once occupied the niche in the queen's chamber, if I am right in identifying this statue with the co-called "statue of Cephren" in the Boulak museum. Such a statue, though as life-like as Pigmalion's Galatea, could have no use for air-channels, never having breathed the breath of life, and, therefore, being incapable of revival. On the other hand, a dead body, having once lived, might aptly represent the dead in trespasses and sins, and their capability of resurrection to newness of life through the regenerating influence of the Holy Spirit; and so the king's chamber, with the dead body in its granite sarcophagus, was furnished with air-channels, while the queen's chamber, with the diorite statue in its limestone niche, was furnished with none. Moreover, the queen's chamber, with its salt-incrusted vestibule, its walls of submarine limestone, its sunken floor and its depressed niche, speaks of the sadly remembered, conservative, fosciliferous past, all the more pathetically for its desertion by the life-like statue that once commemorated the presence of its mortal inhabitant. The king's chamber, on the contrary, above and beyond, regnant with the upheaved granite of its walls, of its raised floor, of its roof and chambers of construction, and of the raised block and uplifted portcullis in its antechamber, speaks of the triumphant and glorious future, of the resurrection and the coming of the Christ in his kingdom, all the more eloquently for the absence

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of the prophetic bones that once occupied its granite sarcophagus. These contradistinctions between the king's and queen's chambers, including that between the dead body and the diorite statue of the treasurer who "hewed him out a sepulcher on high and graved a habitation for himself in a rock," seem to me very appropriately symbolic of the contradistinction between "the house of Joseph" and "the house of Judah."

But what proof is there that the traditional diorite statue in the niche of the queen's chamber was an actuality, and that it was sufficiently life-like and far-removed from monstrosity not to have been intended as an object of idolatrous worship, as some suspect it to have been? I have already intimated its identity with the Egyptian statue, or rather statue in Egypt, called Cephren's; but as to the correctness of this ascription, whoever will attentively consider it from the standpoint of philosophic and artistic criticism, must recognize in the so-called statue of Cephren such a wonderful superiority to all purely Egyptian types and works of art, and such a striking similarity in physiognomy to the descendents of Joseph through Ephraim and Manasseh, as to furnish the best of reasons for believing it to have been a work of divine inspiration, representing neither Cheops nor Cephren, but their divinely inspired prime minister, the Hebrew builder of the Great Pyramid. Cephren, having been the survivor of the good Philitis by more than forty years, must have been the Pharoah to do him appropriate honors. For this reason I think that Cephren not only placed the body of Joseph in the coffin in the king's chamber, but also placed his statue in the niche of the queen's chamber, and that this became an object of idolatry under Mycerinus. I think, too, that when Ratœses, the grandson of Cephren, became aware of the desecration of the Great Pyramid in the abstraction of the bones of its deified builder, he ordered a removal of the idolized statue of this august personage to Cephren's temple of the Sphinx, affording in this natural association of ideas equally natural reasons for the development of the supposition that the statue was Cephren's.

The necessity for an explanation of the fact that the statue in question is called Cephren's, whether it is identical with the tra-

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ditional diorite statue in the niche of the queen's chamber or not, is the absolute absurdity of the supposition either that it was a representation of an Egyptian king or the work of an Egyptian artist. In this dilemma reason justifies us in considering it both the representation and the work of an inspired Hebrew. There is nothing more incredible in this than in the fact that the statue of Thorwaldsen was the work of his own hands. Such a juvenile stage of artistic development as that which the ancient Egyptians exhibited in their ambitious attempts at sculpture and pictorial representation—showing such want of all ideas of grace and rules of perspective, and so forcibly reminding us of the similar, though better productions of the Aztec relatives of the Egyptians in Central and South America—seems to me no less inconsistent with a rational belief in the so-called "statue of Cephren" as the work of an Egyptian sculptor than with a rational belief in the so-called "Pyramid of Cheops" as the work of an Egyptian architect. Considering all the artistic truth to nature wrought into the one, and all the mathematical truth to nature wrought into the other, the inspirational theory is the only rational explanation of either; and to whom can the inspiration be more reasonably ascribed than to "such a man" as the interpreter of Pharaoh's dreams? For the accomplishment of works four thousand years ago equal to the highest art and science of the present day, we may look on Joseph after his ten years' imprisonment on account of his purity and goodness, and enquire, in the language of Pharaoh, "Can we find such another as this, a man in whom is the spirit of the Gods?" (Genesis xli, 38.) Certainly the exceptional statue of which I speak is far more conspicuously superior to all unquestionably Egyptian statuary than the Great Pyramid is to all unquestionably Egyptian pyramids; and no one can recognize this fact without seeing that it is no more an image of Cephren than the Great Pyramid was the tomb of Cheops. Like the latter, it is "*in* Egypt, but not *of* Egypt."

Sir Henry Rawlinson, in his 'History of Ancient Egypt,' expresses the opinion that Cheops and Cephren, or Khufu and Schafra, as he prefers to call them, were the greatest tyrants that the world has ever known, earning the hatred and detesta-

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tion of their subjects by compelling them to build the two oldest and greatest of the pyramids, for no other purpose than to entomb their royal corpses, in honor of their infamous lives. And yet, in spite of his natural expectation of seeing the features and expressions of a Nero or a Caligula in a reputed statue of one of these tyrannical monsters, this is what he says of it:

> Shafra is the first of the Egyptian kings whose personal appearance we can distinctly and fully realize. Two statues of him, in green basalt, his own gift to the temple of the Sphinx, show him to us such as he existed in life, bearing upon them as they do the stamp of a thoroughly realistic treatment. The figure of the king is tall and slender, the chest, shoulders and upper arm well developed, but the lower arm and the lower leg long and slight. The head is smallish, the forehead fairly high and marked with lines of thought, but a little retreating, the eye small, the nose well shaped, and the lips slightly projecting, but not unduly thick; the chin well rounded, and the cheek somewhat too fat. The expression, on the whole, is pleasing, the look thoughtful and intelligent, but with a touch of sensuality about the under jaw and mouth. There is no particular sternness, but there is certainly no weakness in the face, which is that of one not likely to be moved by pity or turned from his purpose by undue softness of heart. (Volume I, page 57.)

Considering the demand of the moral nature in every true man for self-conscious consistency, I think it probable that Rawlinson's physiognomical judgment of the supposed statue of Cephren conformed, as far as the stronger part of his moral nature would allow, to his *a priori* judgment of the character of the original. Had he taken this diorite or greenstone statue, as I do, for an image of Cephren's prime minister, produced by the minister's own hand under the influence of the spirit of truth in filial loyalty to nature, it is likely he would have seen no "touch of sensualty about the mouth," and no occasion to remark that the face "is that of one not likely to be moved by pity," though he might have thought of it as belonging to one not likely to be "turned from his purpose by undue softness of heart," his purpose being the fulfillment of the designs of Heaven for the greatest good of the greatest number, and for the reëstablishment of the church and kingdom of the Heavens on earth, in "the times of the restitution of all things."

From a utilitarian standpoint, the niche in the queen's chamber, with its width of over four feet to its height of thirteen feet on the sides, and with its depth of about three and a half feet to its height of fifteen feet in the middle, affords clear evidence of an intentionally grand and well-proportioned accommodation for a statue and pedestal of noble dimensions. Imag-

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ining the statue standing in its place, the curious fact of its situation northward of the middle of the east wall may be taken as an indication of the direction from which the original came into Egypt, and in which his bones would return to "the parcel of ground" given him by his father Jacob in the land of Canaan. The diorite statue could easily have been introduced to its "habitation" ere the ascending passage was closed by the granite stopper, and more easily still when the Great Pyramid was in its queen's-chamber stage of construction. The only difficulty is that of finding a means of egress on the occasion of its removal from the Great Pyramid to the temple of the Great Sphinx. This must have been accomplished, if at all, by a withdrawal of the granite stopper, and this could have been effected by the same machinery which let the stopper into its present position, debarring access to the sacred remains of the honored prime minister from the time of their committal to the granite sarcophagus. My idea is that the machinery by which the granite stopper was carefully slided up and down consisted simply of a rope and pulley attached by its lower end to a ring in the upper end of the stopper, and by its upper end to a loop through the four-inch drill-hole of a certain granite slab fastened securely to the great step at the south end of the grand gallery. This granite slab, with the drill-hole in it, I deduce from the fragment described by Petrie on page 28 of his "Pyramids and Temples of Gizeh." By the supposed machinery attached thereto, as to the unalterably fixed point, the stopper could have been drawn up into the space between the ramps, out of the way of the passage of the greenstone statue from the queen's chamber to the temple of the Sphinx.

But Rawlinson says that to this temple Cephren contributed *two* statues of himself—two statues of one and the same person to one and the same place, at one and the same time. Is this reasonable? Is it not more in accordance with the fitness of things to believe that the person was the prime minister of Cheops and Cephren, and that of his two statues Cephren contributed one to the temple of the Sphinx, and the other to "the secret place" of the Great Pyramid, to signify the authorship of the two grandest monuments on the Gizeh rock by one and

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the same inspired personage, and their intimate relation to each other as representing the relationship between the earth and the signs of the zodiac? I think so, and that when Ra-Tœses learned that his foster-relative, Ra-Mœses, had robbed the Great Pyramid of the bones of its inspired architect, and had despoiled it of its treasures, he said: "I will overtake, I will divide the spoil; my lust shall be satisfied upon them; I will draw the sword, my hand shall repossess." (Ex. xv, 9.) I think, too, that when Aseskaf, the last king of the fourth dynasty, learned of the overthrow of his father in the Red Sea, and saw the impossibility of repossessing the bones of Egypt's great benefactor, he ordered the idolized statue to be taken from the queen's chamber and transported to companionship with its mate in the temple of the Sphinx, where it would be free from the desecration thenceforth attached to the Great Pyramid.

If any one thinks that in the foregoing I have turned aside from my subject to find support to my theory of its connection with Joseph, let him consider the fact that among the thousands of statues in ancient Egypt the only ones "thoroughly realistic" were two in marked contrast with the absurd conventionality, or rather juvenility, of all the rest; and if of these two one can be shown to have been contributed by Cephren to the niche in the queen's chamber, let him ask himself if this one must not needs be very properly included in our identification of the queen's chamber with the "habitation in a rock" graved for himself by the treasurer with whom Isaiah compares the treasurer of Hezekiah. Of course, those who hold to the opinion that Cephren was the builder of the second pyramid, and that he could not have been one of the two kings designated in the "quarry marks" discovered by Howard Vyse in the first of the Great Pyramid's "chambers of construction," must needs consider it far from shown that Cephren contributed one of the life-like statues, either of himself or of somebody else, to the niche in the queen's chamber of the "Pyramid of Cheops." But if it be unreasonable to believe that Cephren contributed two statues of himself to the temple of the Sphinx, those who believe him to have been the proprietor of the second

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of the two Great Pyramids ought to be able to find a niche therein for one of them, as also to show that he was buried in the sarcophagus therein, rather than in the outside tomb called "Cephren's," not far from the tomb of Cheops, as represented in the map of the Gizeh rock in 'Our Inheritance.'

After all this array of argument in favor of the habitation of the queen's chamber by a graven image of the inspired builder of the Great Pyramid, is it not condemned by the very first of the twelve curses commanded by Moses to be pronounced by the Israelites themselves from the top of Mount Ebal: "Cursed be the man that maketh any graven or molten image, an abomination unto Jehovah, the work of the hands of the craftsman, and putteth it in a secret place." (Deuteronomy xxviii, 15.) That this curse was directed against an extreme propensity of the Israelites to fall into a certain practice of the idolatrous Egyptians and Canaanites, that of putting the image of a deified hero in the "secret place" of his treasure stronghold, on the occasion of its conversion into his monumental tomb, I not only freely admit but earnestly maintain. For I also claim that the diorite statue in the "secret place" of the Great Pyramid, though the "graven image" of a hero, was not that of one intended to be deified and worshiped, and was not "the work of the hands of a craftsman," false to nature, like all the idols that were ever made, but was, on the contrary, the "graven image" of the world's most perfect type of the Saviour of mankind, wrought by his own inspired hands, under the influence of the spirit of truth, making it as truly a work of art, in distinction from the work of a skillful mechanic, as the most masterly statuary of the present day, and thus making it the very opposite of "an abomination to Jehovah." It had, indeed, become idolized as did the brazen serpent made by Moses, and a snare to the Israelites, but the maker "meant it not so, neither came it into his mind."

(10) *The sense in which the treasurer with whom Shebna is compared may have been said to hew out and grave his chambers in a structure of multifarious stones as in a solid rock.* To most readers of THE INTERNATIONAL STANDARD, the Great Pyramid was evidently intended to represent, in its perfected condition,

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the individuality of perfection, or that of the self-existant being, the *I Am*, and therewith his perfect incarnation in humanity and his manifestation in the spiritual and material universe. Hence, though composed of a vast number of rocks, it is called in the sacred Scriptures, "the Rock," and it is thus referred to as a symbol of the triune Jehovah, the Elohin to be incarnated in the person of the Christ. For example, Moses says, "I will publish the name of Jehovah; ascribe ye greatness to our Gods; he is the Rock; his work is perfect." (Deut., xxxii, 4.) A great rock of perfect workmanship and individuality. David says, "Jehovah is my Rock, and my Fortress, and my Deliverer: the God of my Rock; in him will I trust: he is my Shield, and the Horn of my Salvation; my high Tower, and my Refuge, my Saviour." (2 Samuel, xxii, 2, 3.) In Isaiah, according to the marginal correction, we read, "Trust ye in Jehovah forever; for in Jehovah, Jehovah is the Rock of Ages." (xxxi, 4.) To those who "flee for refuge" to the Saviour of sinners, He is "a hiding place from the wind, a covert from the tempest, and the shadow of a Great Rock in a weary land." (Isa. xxxii, 2.) In the literal sense of the term, the "weary land" was that in which the Israelites wearied of their hard bondage; was it not? That a literal rock, in the sense of a unity of structure, is referred to in these passages as a symbol of Jehovah, few will be disposed to deny; and that it was the great tower, altar, refuge, or the Great Pyramid, in the condition in which it was contemplated by the prophets, all who believe in "our inheritance in the Great Pyramid" will be disposed to admit. The "Rock of Ages" is the "Ancient of Days" and the "memorial to all generations." To represent the unity of the many members of the one body more perfectly, the Great Pyramid was clothed with a garment of casing-stones, so uniform in whiteness and so closely fitted to each other and to the stone of the chief corner as to give to the entire structure the appearance of a solid rock. Moreover, in order that the sepulcher and habitation for the dead body and diorite image of its architect might appear to have been hewn out and graved in this sold rock, their interior stones were so perfectly adjusted to each other, and so

ed and polished to a common surface, as to be indistin-

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guishable. These principles of construction, as well as numerous passages of Scripture, including those already quoted, are confirmatory of the opinion of Mr. J. Ralston Skinner and others, that the "rock out of the water," the symbol of Christ Jesus and of those who "follow him in the regeneration," constituting the Christ and his kingdom, was the Great Pyramid of Jeezeh.

The "hewing out and graving," by "line and plummet," in the rock foundation on which the Great Pyramid stands, was in a manner imitated in the mathematical passages and chambers of the superstructure, as it were in a crystaline growth and development of the parent rock; and seemingly in recognition of this synonymy in the Great Refuge representing the Christ, in contrast with the incongruity of a refuge of the sand-hill description, it is said in Isaiah: "Behold, I lay in Zion, for a foundation, a stone, a tried stone, a precious corner-stone, a sure Foundation: he that believeth shall not make haste. Judgment also will I lay to the line, and righteousness to the plummet; and the hail shall sweep away the refuge of lies, and the waters shall overflow the hiding place." (xxviii, 16, 17.) Finally, enquiring of Pharaoh's treasurer his object in "hewing him out a sepulcher on high and graving a habitation for himself in a rock," his reply appears to be, that he might represent the Christ both in himself and in the Great Pyramid—in himself "the stone, the Shepherd of Israel," and in the Great Pyramid "the Rock of Ages," the "refuge from sin," the "strong tower from the enemy;" also the great treasure-stronghold, "wherein are hid all the treasures of wisdom and knowledge" (Col. ii, 3); also the Great Monumental Tomb, from whose "chambers" and "secret place of the Most High" he might say to Israel, in the name of the promised Victor over Death: "Thy dead men shall live, together with my dead body shall they arise. Awake and sing, ye that dwell in dust: for thy dew is as the dew of herbs, and the earth shall cast out her dead. Come, my people, enter thou into thy chambers, and shut thy doors about thee: hide thyself as it were for a little moment, until the indignation be overpast. For behold, Jehovah cometh out of his place, to punish the inhabitants of the

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earth for their iniquity: the earth also shall disclose her blood, and shall no more cover her slain." (Isa. xxvi, 19-21; and see Rev. vi, 9, 10.)

J. W. REDFIELD.

HEBREW METROLOGY.

The subject of Hebrew Metrology, as ordinarily thought of and accepted, is not to be touched on in this paper for want of space. It would at any rate, be but repetition of that which can be gleaned from many works.

Tentatively we have discovered that the *radius seconds* of the circle of 360 *degrees*, viz., 206,264.70+ seconds, practicalized in measure as $20.^{626470}$ imperial British inches, was an ancient Egyptian *cubit* value—the so-called *Nilometer* cubit. But in the numerical value of a proportion is the natural outgrowth or development of, geometrically, a *pi* value, wherein the *pi* ratio is 20,612 for circumference of a circle, to 6,561 for diameter. The proportion is this: 20,612 : 6,561 :: 64,800 : $20,626^{470}$. And, indeed, 20,612 was utilized in like manner as a measure in the same standard (British inches), so that $20.^{612}$ such inches made the length of another of the Egyptian cubit measures, the so-called "Turin" cubit. By actual microscopical tests by Bidone and Plana (Seyffarth) the Turin cubit measured $20.^{61172}$ British inches, and by Wilkinson the Nilometer cubit measured $20.^{625}$ British inches.

The application of these cubit measures to the best reported measures of the Great Pyramid, proves that the cubits were derived from the above formula; as to which the actual cubits referred to show so close an approximate.

The learning of the Egyptians was that of the Hebrews, and there is demonstration that the most sacred measure of the Hebrews was the Turin cubit and its derivative, the Nilometer cubit. From this proportion 20,612 to 6,561 (which was es-

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teemed in Holy Writ as true *pi*, and beyond doubt is*) the modified form of 355 to 113 is to be obtained. (See 'Crown Jewels of the Nations are Their Measures.') From these two ratios, viz: 6,561 to 20,612 and 113 to 355, the entire system of sacred metrology of the Hebrews took its rise, as is found demonstrated in the Hebrew text of the Holy Bible, especially in Genesis and the five books of Moses. One may imagine how sacred these measures must have been esteemed, when it can be said that on the ratio 113 to 355 rested what is called in the Sacred Record the "*Man even Jehovah*" measure (Genesis iv, 1), and that this rested for its origin upon the radical one of 6,561 to 20,612.

The interior, or sacred metrology, was not open with the Hebrews any more than with the Egyptians. To illustrate this: as said, the Nilometer cubit is found to have been 20.$\frac{626470}{}$ British inches in length; but if an Egyptian cubit stick of this length, or of the length of 20.$\frac{612}{}$ of such inches was examined it would be found that no division of the same would show any relation whatever to the British inch, or any denomination of measure founded thereon, as the foot, etc. Thus the workman would be in complete ignorance of such relation as belonging to the measure he was using.

The secret, as we have empirically and tentatively discovered, lay in this, viz: the knowledge and use of the Imperial British inch, and the denominations based on it, existed as a knowledge separate and secret and sacred. Either of the cubits mentioned was known, to those possessing this secret, in its totality, to be the one 20.$\frac{612}{}$ of such secret, sacred inches, and the other 20.$\frac{626470}{}$ thereof; and from these, by the transference of certain uses of the cubits themselves into this new realm of measure, an especial interpretation, perfect in its coherences and applications, as, for instance, to astronomical times and cosmic distances, etc., was made.

As to metrology: Instead of a valuable adjunct to the Biblical system, having mention here and there in the Sacred Text,

*It may be interesting to those who are not aware of the fact to know that Professor Roche of Philadelphia, has, by the simplest application of the rules of Euclid, shown geometrically the exact equality of a square for any given circle in area; and this shows essential error in what is called established π.

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the entire text of the Holy Writ, in the Mosaic books, is not only replete with it, as a system, but the system itself is that very thing, *in esse*, on which, and out of which, and by the continuous interweaving use of which the very text of the Bible has been made to result, as its enunciation, from the beginning word of Genesis to the closing word of Deuteronomy. For instance, the narratives of the first day, of the six days, of the seventh day, of the making of Adam, male and female, of Adam in the Garden, of the Garden itself, of the formation of the woman out of the man, of the extension of time to the flood with the genealogy, of Ararat, of the Ark, of Noah with his dove and raven, of the space and incidents of Abram's travel from Ur of the Chaldeans down into Egypt before Pharoah, of Abram's life, of the three covenants, viz: with Noah, with Abram, and at Sinai, of the construction of the Tabernacle and the dwelling of Jehovah, of the famous 603,550 as the number of men capable of bearing arms who made, with their families, the exodus out of Egypt and the like—all are but so many modes of enunciation of this system of geometry, of applied number ratios, of measures and their various applications. This system embraces, for a part thereof, that same one which we find conclusively to be embraced in the structure of the Great Pyramid.

This system is a language in, of and by itself, which, moreover, embraces much which at first seems apart and separate from the discussions of exact science and astronomy, viz: for example, man in his various conditions and relations to what we call God, and also to nature, especially in the department of the exertion of the parturient energies. The reading of this language is an outgrowth from, in harmony with, and partly determined by, the visible and first face text. To the extent to which this language was known among the Jews, the learning and teaching thereof was called Cabbalah.

In the narrative form man himself, as the Adam, the archetypal man, the Adam Kadmon, was taken as the grand representation and containment of this entire system. In himself he was considered as the reflection of the Component parts or nucleations out of the Willing, Intellectual, Unknown, Incompre-

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hensible First Cause; and thus became, in substance, thought and conception, the exponent as to all that came within his knowledge of that First Cause as to the phenomena of its operations; Itself thus, in him, becoming personal out of the impersonal. Hence in and of himself he contained this very system, which became in the text of Holy Writ, expounded in its chief words of nomenclature through himself and his names. As the First Cause was utterly unknown and unnameable, such names as were adopted as most sacred, and commonly made applicable to the Divine Being, were, after all, not so, but were such manifestations of the First Cause, in a cosmic or natural sense, as could become known to man. Hence these names were not so sacred as commonly held, inasmuch as with all created things they themselves were but names or enunciations of things known, either by experience or revelation. The ratios to which belonged 20,612 and 20,626 were those from whence came literal and matter of fact measures, which, in turn, took names from the members of the man. Thus the Hebrew system of measures rested on the thumb's breadth, the digit, the palm, the span and the cubit. These measures were made, by a beautiful mode of construction, to coördinate measures of space with those of time. By the very fact that they borrowed from a man his members as a mode of nomenclature, so in the comprehensive term man himself, in the numbers of his name, viz: 113 was found a typical and subordinate source or mode of measures, peculiar to themselves, in use and application and intendment. To somewhat explain this, let us refer to the canon of architectural measures by Vitruvius: Suppose the circle of the base of a column, for esoteric measures to have been taken from the form of a man stretched out on the ground looking upward, so that taking his navel as a center, the circumference line was made to touch the extremities of his outstretched fingers and toes. Now this man, thus occupying this space, might be held to be the typical or man measure of the base of this column, out of which and constructed with which should belong the attending circumstances of height, shape, capital, grooves or flutings, *et cetera*, of the column; and all this to grow out of the ideal and merely abstract number of his name,

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irrespective of whatever actual measures might be given to such a column, as so many cubits, palms, digits, or what not. Thus this column, irrespective of its actual measures, could be read in terms of its ideal abstract typical ones, as for instance: *Man* is 113; this is diameter to 355 for circumference, and 355 for one thing indicated the measure of the lunar year (*Shanah*) in the natural measure of days, and at the same time was the proper name Pharoah. So, also, 355 is the outgrowth of the use of the word *dove* in the flood narrative, for its value is 71, it is used five times and $71 \times 5 = 355$. Now, to resume, suppose that for height the base of the column, or man measure, should for this purpose be taken for the length of the foot of the man, and by a rule of construction the height of the column should be taken as six times the length of the foot. Thus, the base being 113 (for *man*) then the height would be $113 \times 6 = 678$; and this is the value of the letters used for that other bird mentioned in the flood narrative in the expression or word, *āth-h'orebv* (*sic*, in the text, as connected by hyphen) "*and-the-raven*," the values of the letters of which give as their sum this same number 678. Thus one can see that running along with actual measures is a typical system and use of same. This raven use of the numbers 678 is of great significance and found in various places; for instance: We have it first as the prototype in the flood narrative. We also have it as the deepest underlying key to Grecian architecture in its inception, and, moreover, Rawlinson, in his 'Herodotus,' says that the word is that from whence the name Europe. We have it to day, in such uses as causes the utmost amazement and surprise, at the continued familiar use to some who must now be initiates of this kind of learning. But what is of the most interest to us is that the use crops out in the Great Pyramid. One of the most wonderful places in the structure is found in the attainment of the surface of the great step, where one arrives to the plane of the floor and open entrance to the Holy of Holies, or the king's chamber. The height of the grand gallery from the face of this step is 339 British inches. This is radius to a diameter of $339 \times 2 = 678$ inches, or this very raven number. The radius is taken to show division into two parts, a favorite use, which are 1065 each.

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For the ratio 113 to 355 multiplied by 3 equals 339 to 1065. Now the numbers 1065 are the significant ones of Jehovah's name, viz.: *jod, vav, hé*, or 10 and 6 and 5, which the rabbin's extol so beyond all other numbers and say that by their uses and permutations, under the law of *T'mura*, the knowledge of the entire universe may be had. The entire circumference will be $1065 \times 2 = 2130$, of which 213 is the factor with 10; and 213 is the first word in Genesis, viz.: *Rash*, or *Head*, from whence the entire book. By one of the permitted changes 1065 becomes 1056, and in this we have the numbers of Mt. Sinai and those to show the descent thereon of Jehovah in a bush of fire, the chief object of the use of which numbers, so arranged and applied on the Mount, is to afford as a result the *exact* astronomical value of the lunar year, viz.: $354.^{3670548}$ days—that is, in natural measure. Besides this, and what is most remarkable, is the fact that these same numbers, under the letters given, were introduced into China some twelve centuries prior to the Christian era and taught by Wang, and quoted by Saoutz, the preceptor of Confucius, as the root and base of all knowledge, under the form of an enigma or riddle.

The distinction between the two branches of this general system, viz., between the actual measures from the ratio 6561 to 20612, and the ideal abstract *man* measures, from the ratio 113 to 355, gives rise to two great and well settled distinctions in the Mosaic Books. As a use, derivative and reduction from the first, we have the great God-word *Elohim*. The running characterizing small numbers of this name, in Hebrew, are 13514, which, placed on the bounds of a circle, will serve to give expression to the measure of the same; for they can be read as 31415, which is what we to-day call the value of π, and is so significant as to be used in astronomical tables as *a constant co-efficient*, that is, it is the numerical value of the circumference of a circle whose diameter is *one*; hence the Biblical expression by the rabbins: "His name is *Echod*," or *One*. This is the distinctive, so-called, *Elohistic* branch. As a distinctive use under the second, we have the "measure of a man," or 113, which also is significant of a π value, inasmuch as it is diameter of a circle to a circumference of 355. But in its Biblical

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origin, Genesis, chapter iv, verse 1, it is called the "Man Even Jehovah" measure; and this is obtained in this way, viz.: 113 × 5 = 565, and the value 565 can be placed under the form of expression 56.5 × 10 = 565. Here the *man* number 113 becomes a factor of 56.5 × 10, and the reading of this last number expression is *jod hê vav hé*, or Jehovah. Hence this is the distinctive, so-called, *Jehovistic* branch of these books. The expansion of 565 into 56.5 × 10 is purposed to show the *emanation* of the male (jod) from the female (Eva) principle; or, so to speak, the birth of a male element from an immaculate source.

In Al-Chasari, by Hallevi, written in the twelfth century, the author clearly shows the distinction between the names Elohim and Jehovah, in this, viz., that the first is a generalized term, serving as a constant as entering into all created works and forms whatever, while the name Jehovah is a particular or discrete manifestation of most especial value to man because of His immediate intervention in and superintendence over man in all the most cherished details of his being, especially in the department of conception and birth, *i. e.*, as the energizing activity.

I now assert that what has been said can be proven to demonstration from the holy books, and then reinforced and confirmed by a multitude of supporting facts, scattered all along down through history and tradition. It all goes to show that the world of thought and study, through these thousands of years, has, in accepting the Biblical record on its first face reading only, been taking the *shadow* for the *substance*; and hence the interminable difficulties and unending changes of exegesis.

And in view of this, let me close this contribution with two quotations—one from Schopenhauer and one from Ralph Waldo Emerson.

Schopenhauer, in 'World as Will and Idea,' says:

In the idea of perception, illusion may at moments take the place of the real, but in the sphere of abstract thoughts (such, for instance, as compose the religious philosophy and Biblical exegesis of our day) error may reign for a thousand years, impose its yoke upon whole nations, extend to the noblest impulses of humanity, and, by the help of its slaves and dupes, may chain and fetter those whom it cannot deceive.

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Ralph Waldo Emerson says:

The religion that is to guide and fulfill the present and coming ages, whatever else it may be, must be intellectual. The scientific mind must have a faith which is a science, at first cold and naked, a babe in the manger again, the algebra and mathematics of ethical law, the church of men to come, without shawms, psaltery or sackbut; but it will have heaven and earth for its beams and rafters, with science for its symbol and illustration; and it will fast enough gather beauty, music, pictures and poetry.

J. RALSTON SKINNER.

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*THE CAMPAIGN OF MOSES IN THE EXODUS FROM EGYPT.

By Monsieur E. Lecointre, Engineer on the Retired Marine List and Officer of the Legion of Honor. Translated from the French by Mrs. A. M. Searles.

The expedition of Moses in the exodus from Egypt remains enveloped in a profound mystery that few have sought to penetrate. The divine intervention plays therein a role so grand that it absorbs our whole attention, and we scarcely turn our eyes upon the other interesting features of the narrative.

Nevertheless, God only comes to the aid of his people to save them from desperate situations where human aid is powerless. Thus, seven days after their departure, He opened for them a passage through the waves of the Red Sea—Salvation for Israel! Chastisement for Pharaoh! Twenty days later He sent the manna to save them from the pangs of hunger, and four days later still, He caused the rocks of Horeb to spout forth water to allay their thirst. But for the remainder, the people lived, marched and manœuvred under the orders of Moses, who consequently held the important post of commander of the expedition. If he has not spoken on this point, it is because he had received an order to write a book, destined to record for posterity the wonderful works of the Lord in behalf of his people, and not to give the history of the campaign. (Ex. xvii, 14.)

Interpreters have expended not a little time and ingenious research in attempts to discover the exact point where Moses

* This book has a preface by M. L' Abbé Moigno, of which a fine translation was made by Mrs. Emily Lewis, and was published in the July, 1883, number of the STANDARD.

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crossed the Red Sea, and justly so, for if once this point is established, the days of rest marking the stations inevitably conduct them even to Mt. Sinai. Nevertheless, up to this time, this research has failed of success and still remains veiled in obscurity. Of all the solutions that have been presented thus far, not one offers incontrovertible evidence. In the January, 1881, number of the *Revue des Questions Historique*, the learned Abbé Vigouroux has pointed out the errors in each of these solutions, and rejected them all. But that which he proposes is very far from settling the question.

In the present work we propose to study this mysterious campaign of Moses, or rather the first part of it—that which conducts him to Mt. Sinai—for it is up to this point that the accounts seem to be at fault.

PART FIRST.—THE EXODUS FROM EGYPT.

In the second year of the great famine, which for seven years rendered Egypt and her neighboring countries desolate, Joseph induced his father and his brethren to come to the land of Egypt, settling them in the land of Goshen. There they multiplied exceedingly, and in after years their descendants were oppressed by a later Pharaoh, to whom Joseph was unknown. He was, as we shall presently see, the founder of the nineteenth dynasty. Seeing them increasing so rapidly in number, he began to fear their prospective power, and therefore wished to enfeeble them and to reduce them to slavery. This oppression was continued by his successors, who employed them to build the great monuments, the ruins of which still cover the land of Egypt.

Finally Moses received from God, on Mt. Horeb, the commission to deliver his people and to conduct them to the land of Canaan. In consequence of the ten plagues with which he smote Egypt, he acquired considerable influence, and at last obtained, through the terror of the reigning Pharaoh, permission to depart. At midnight on the fourteenth of Abib, corresponding to our March, the signal was given. Early on the morning of the fifteenth they left their homes, and putting behind them the whole land of Goshen, they encamped the first

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evening at Succoth, and the second at Etham, at the entrance to the desert. There Moses received the order to change the route and to encamp on the Egyptian bank, at the foot of a certain region called Pi-ha-hi-roth, between Migdol and the sea, opposite Baal-Zephon, where, some days later, they were surprised by the army of Pharaoh. It was there that Moses stretched forth his hand over the waters, which were divided, giving passage to the Israelites but engulphing the Egyptians.

Such is the resumé of the facts. To reconnoiter these places and review the action, the most rational method would be to collect the references scattered through the sacred text, then search for the places—in a country well known to-day, thanks to the constructing of the Suex canal—to which these names are applied. The Bible and geography will be our sole sources of information. We shall lay aside the pretentious traditions and etymology which have played a role more or less important in past accounts.

The tradition does not exist among the Jews ontside of the Bible and the Talmud. How we wish it had been preserved among the people who have come in such numbers to replace, in the land of Egypt, the sons of Pharaoh. As to the spelling, here is an example of the results to which it has led. What does the word Pi-ha-hi-roth signify? We know not whether it is a common or a proper name, whether it is Hebrew or Egyptian. One knows very little of the first language, and still less of the second. So much being granted, let us hear the commentators.

Dom Calmet, in his commentary, considers it a proper name, but at the same time states explicitly that different versions have made it a common name, and have translated accordingly the passage, *Venerunt contra Pi-ha-hi-roth.* The Septuaguint says: "They came opposite the market town;" the Arabic, "to the gate of Bébélah;" the Syriac, "to the mouth of the ditch, or trench." *(Ostium fossati.)*

Pere Sicard and Pere Pujol take the latter definition. "Thouaireq," says Pere Sicard, "is the same word that in the Bible is called Pihahiroth; I find the proof of it in the Arabic; in He-

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brew it signifies 'the mouth of the hole.' Thouaireq in Arabic means 'many little holes, ditches or canals.'" *

Pere Pujol is not less firm in his convictions. He says: "The Arabic names encourage me by their eloquent significations to stand by my convictions. Thouaireq, that is, 'the ditches, the canals,' and Pihahiroth is by the ancient Syriac very properly rendered *ostium fossati.*"

Unhappily Moses says: "*Omnis equitatus et currus Pharaonis et universus exercitus erant in Pihahiroth*"—"The cavalry, the chariots and the entire army of Pharoah were in Pihahiroth"—which renders their solution ridiculous, for, according to Pere Sicard himself "Thouaireq is nothing but three or four small pits of salt water, confined in rocky reservoirs hidden in the sand, which are only three or four paces long, and much more shallow, and to which the passage is narrow.

Monsieur Brugsch understands it to mean the entrance to Khiroth, or gulfs of the lake Stirbon.

Dubois Aymé is of the opinion that Pihahiroth owes its name to this circumstance: "That it overlooks the entranee to the gulf," but he does not say why. Then he identifies it with Adjerout, "a name," he says, "analogous to the Hebrew *Hahiroth*, or the Egyptian *Adjerouth.* This Adjerout has a well of drinkable water, and it was for this single reason a place well known and named in olden times."

The Abbé Vigouroux thinks that this identification, "though not unquestionable, may probably be accepted as the true one."

But Linant de Bellefonds-Bey, who has for many years filled the position of minister of public affairs in Egypt, and consequently understands very well the language of the country, teaches us that "*Agerout*, in Arabic, signifies a place, or thing, barren, arid, uniform; for example, a young man without beard, or man who is bald-headed is called *Agerout.* Agerout is a modern fortress, built upon a high, arid rock, three hun-

*If the entrance or opening of the canals, may it not be that it is because of its situation on the shore of the Red Sea that it received its name? May not the water from the Red Sea at that time have been used for irrigation? I offer the suggestion for what it is worth, perhaps nothing.—(Translator).

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dred and forty-four feet above the level of the sea, with a well dug in the rock two hundred and twenty-nine feet deep."*

Thus it appears that *Agerout* is a modern Arabic word not in accord with either the Hebrew or the ancient Egyptian, and, applied to a fortress, has simply the signification of the name of a chateau such as are common in France, like Chaumont, Calmont, etc.

Linant-Bey also gives his version of *Pihahiroth*, and it is not less singular. He says:

> At that period the gulph reached even to lake Timsah, and consequently to Nefiche, where the Pihahiroth of the Bible was situated. The bay, or swamp of rushes, to-day is called Kroubet-el-bous, an Arabic name with the same signification.

Evidently there is nothing scientific in all this, and the only real information upon the localities that we shall be able to deduce, must come from the part they play in the action wherein they figured. Let us, then, review them, and note with care all that concerns each of them.

*See 'Memoire sur les Travaux Public Exécutés en Egypté,' p. 204.

[*To be Continued.*]

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CHEOPS, GEEZEH AND CHEPHREN.

The symbolic signification of these words I apprehend to be the key to much that is dark as yet to the student of pyramid literature, and believing as I do not only in the general symbolic teaching of the Scriptures, but in the symbolic prophecies relating to Egypt, and notably Hesaias xix., 19, "the altar," and "the votive pillar" "and that it shall be for a sign (or symbol) unto the Lord in a province of Egypt," it seems to me a matter of vital interest to know whether, perchance, God has not hidden in these much disputed terms, names, or appellations, as so many now fully believe he has, in the great stone "votive pillar," the secret of the cosmic universe, or at least the key to a better understanding of the symbol itself. I have found this to be true and wonderfully so of the patriarchal and prophetic names of the Scriptures. Take, for instance, the name of Jeremias. Interpreted it is the key-note to the harmony of the understanding of the whole book, as well as much else that is deep in the plan and purpose of God in his dealings with the nations. The analysis of the name is as follows: *Ieremias—ie* root of *Iemi*—to cause to go or send, *erem*—root of *eremoo*—to lay waste or desolate, and *ia*—root of *iaómai*—to heal—the same root as appears in *Iavah*, or Jehovah, which signifies "the healing breath" (or spirit). The whole meaning of the name Jeremias, "Send thou to lay waste and heal," or, possibly, if the breathing be smooth root *i* of *eimi*—to go, it would then read "Go thou," etc., instead of "Send thou," etc.

Now the analysis of the two Greek words Cheops (*Xeops*) and Geèzeh (*Jeēze*) is evidently as follows: *X* (a cross) the letter here used as a symbolic adverbial modifier of the verb root *ops*—its symbolic significance recognized as far back as history or tradition have carried antiquarian research, *é* the root of *eimi*—to be, being or existence; *ops*, root of the future of *Õrao* meaning to see, here used as a verbal noun—the full form *òpsis*

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lit meaning the seeing, or the way to see, or the process of seeing, or that which enables one to see, a representation—often the human face. Whole meaning (the cross)—a symbolic representation of that which is (being).

Now recall to mind the fact that the significant name by which God announced himself to Habraām was *Ŏŏon*, The One Who Is, or The Being, and then the language of Paul to the Greek philosophers in explanation of who and what God is, "The One in whom we *live*, and *move* and exist" (have our being).

This leads us up to a more intelligent consideration of the next term in question, namely: *Jeēze* or *Geēzeh*. Analysis as follows: *ge*, root of *gea*, contract *ge*—earth, the earth, as a whole, the planet earth; *ê*, root of *eimi*, to be, and *ze*, root of *zeo*—to seethe, or boil, or move with a rotary motion. Whole meaning: "An earth that is in seething (or rotary) motion."

Now, joining the interpretations of the two words we would have a thought in substance as follows: The Cheops of Geezeh is a "symbolic representation of an existing earth that is in motion." Then calling to our aid the assistance of revelation and assuming, as therein revealed, that all the laws or "first principles" of being or existence in this cosmos are analogous to the laws of being in another and higher cosmos or "order of things," is it strange that the searchers into the hidden mysteries of the Great Pyramid should claim that they have respectively discovered, according as they have sought, recorded or symbolized there in the stone the great "first principles" of both the natural and spiritual cosmos, the "times and the seasons," the cycles of the earth itself, and the cosmic arrangement of the Heavenly bodies in their cyclic relation to the earth itself, and to one another, man's destiny, present, past and future, and God's plan and purpose in this matter, the utility of revelation in metric standards, based upon great general principles, great in their simplicity and because they appeal to the average intelligence or universal acceptance or common sense of mankind? If, therefore, God has given us a symbolic teaching of "first principles" underlying the cosmic harmony of existence, animate and inanimate, natural and spiritual (and the very names themselves, in their etymological analysis, as I have shown

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seem to indicate this), we will do well, I think, to encourage one another and in every way stimulate enquiry into this subject of vital importance. In this connection, and suggested by this thought, it may not be considered uninteresting to call attention to the significance of the name Chephren or Chephron, according to Herodotus, the son of Cheops, and his successor in rule. Chephren is the original Greek word, and the variation on the last syllable is dialectic merely. The derivation and interpretation is as follows: X, the symbolic cross, with all its wonderful emblematic import; *ĕ*, root of ei*mé*, to be, and phren, the understanding, including all the faculties commonly denominated "head and heart." The whole interpretation, "a symbolic understanding of existence" (or being). If, then, the account of Herodotus in regard to Cheops, being the name of the person who not only built the Pyramid but closed the temples of idolatry for fifty years, be worthy of credence, we must conclude that this person took both these radical and important steps under the impulse of some sort of a religious conviction, and if his son for fifty-six years more perpetuated and emphasized the same purpose and rule, these names become very significant as the best probable or possible clew to this strange purpose thus worked out; and if, as surmised, these shepherd kings were prophetic seers and servants of God to supplement his revelation of himself in his written and spoken word, should we not moreover expect their work to have a name significant of its symbolic import and hidden mystery? Again, supposing these premises to be true, do not these interpretations exactly harmonize with the awakened expectations of common sense and common reason in regard to a subject that has been so long a mystery? If God were going to teach mankind in enduring symbol any two great truths, would it not be the fundamental facts and the rationale of his own existence and that of the universe in which man lives and moves and has his being? I think so, and, therefore, contribute these thoughts as suggestive aids to those who are better able to follow them out into their ultimate diversities of true science.

CHARLES GARDNER.

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PYRAMID NOTES.

The granite length of the floor in the Great Pyramid's "ante-chamber" is the most convenient dimension whereby to compare the relative lengths of the British and the Pyramid inch. Expressed in British inches, that floor length is $324 \div \pi$: in Pyramid inches, the same dimension is = the number of days in the year $\div 2\sqrt{\pi}$. But that number being subject to variation, let us, for the moment, call it Y. Then granite length of ante-chamber,

in British inches $= 324 \div \pi$.
in Pyramid inches $=$ Y $\div 2\sqrt{\pi}$.

If the British and Pyramid inch were *equal*, we should have:

$$\pi : 2\sqrt{\pi} :: 324 : 365.6000,$$

an equation which, by the way, yields the simple common fractional expression of

$$\sqrt{\pi} = \frac{324}{182.8} = \frac{81}{45.7}$$

a near enough approximation for most purposes,

being .17724288840, etc.,
instead of .17724538565, etc.

But Y is not equal to 365.6; and to get an exact value for it from the Pyramid, we have recourse to the grand gallery, where the extreme length in Pyramid inches is reported to be 1881.6 *exactly*, and also = Y^2 divided by $\sqrt{\pi}$ and then by 40. Hence the granite length of ante-chamber squared = $18816 \div \sqrt{\pi}$, that is, in Pyramid inches; so that $\frac{324^2}{\pi^2}$ British $= \frac{18816}{\sqrt{\pi}}$ Pyramid inches, and dividing by 48, $\frac{27 \times 81}{\pi^2}$ British $= \frac{392}{\sqrt{\pi}}$ Pyramid inches, or $\frac{3^7}{\pi^2}$ British $= \frac{7^2 8}{\sqrt{\pi}}$ Pyramid inches.

The numerical values can be as easily worked out with the larger numbers, but these last are interesting as the lowest in-

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tegral expressions of the relation of the one "inch" to the other.

Now 18816 ÷ $\sqrt{\pi}$	=	10615.791204034 +
And square root	=	103.03296173572 + (P)
324 ÷ π	=	103.132403123548 — (B)
And B ÷ P	=	1.000965141 5057 +
And P ÷ B	=	0.99903578899 69 +

or showing that the Pyramid inch is 1 — 1003.6th longer than the British. (Mr. Latimer's theorems gave 1 — 1031.32 (?); and Mr. Baxendell, at p. 345 of Vol. I. of the STANDARD, brings out, by another hypothesis, 1 — 989.2).

As the Pyramid inch is the 500-millionth of the earth's polar diameter, the length of the axis in "British inches" of the above value will be 500,482,570.75 = 41,706,880.9 feet = 7899.03047 miles.

JAMES SIMPSON.

March 7, 1885.

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THE TWO WITNESSES: THE BIBLE, THE GREAT PYRAMID.

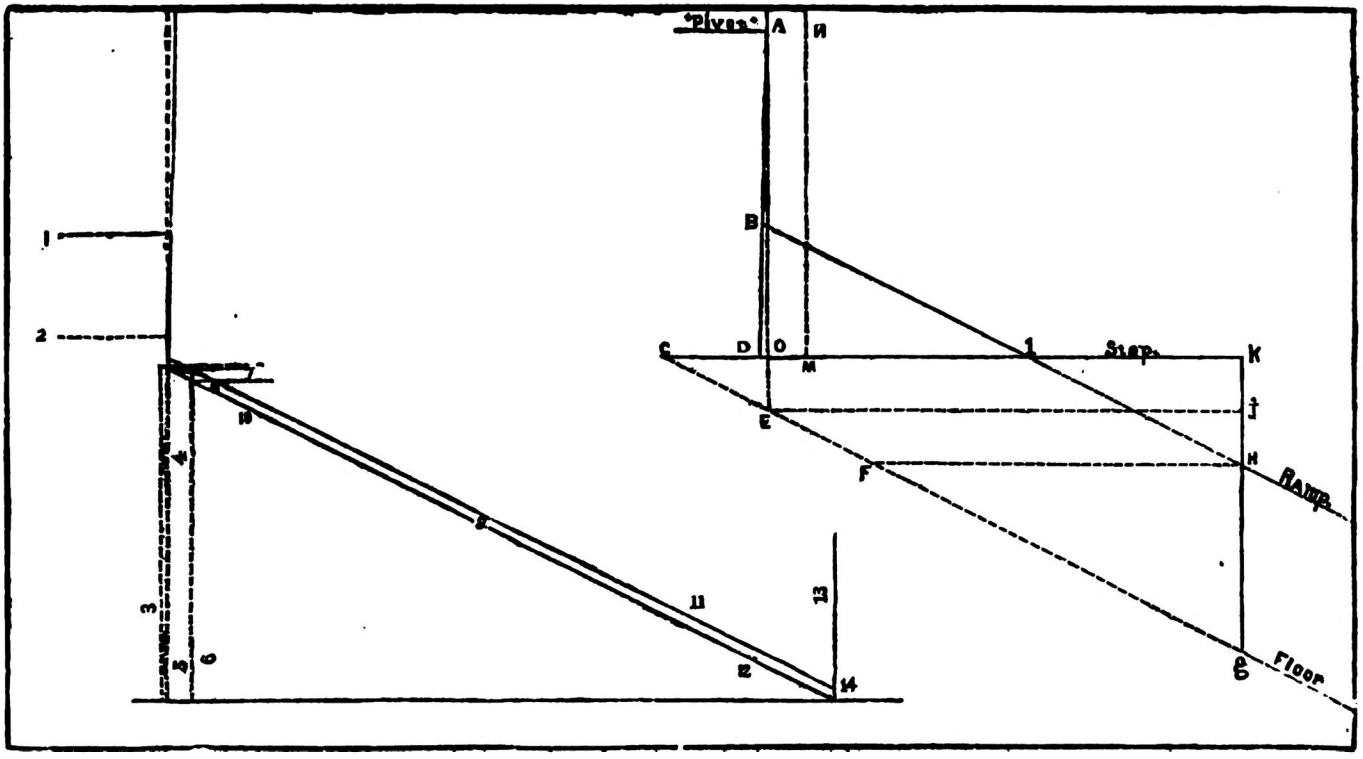
By R. Courtenay, Bombay Civil Service. Bombay, 1884.

Professor Piazzi Smyth has forwarded us a copy of this pamphlet, upon whose title page is indorsed in his handwriting, "A beginning only, but a splendid beginning. C. P. S."

The author of the pamphlet finds, in the dimensions of the grand gallery of the Great Pyramid, a record of lunar periods, and a repetition of the ominous 666 of prophecy. Then, counting a Pyramid inch for a year, he discovers the lines and intersections of lines which exactly mark the dates of the momentous events in history corresponding with the prophetic periods of Daniel's prophecy; also other lines which, reasoning from analogy, must indicate the termination of the unfulfilled periods of Daniel and Revelation. The author's claims are summed up by himself after this fashion:

"In the foregoing pages I have endeavored to keep as close as possible to actual measurements, and to alter them (even then only to the most trifling extent) only when they differed amongst themselves, and when the aid of theory had to be invoked to determine toward what precise quantity they all tended. With one solitary exception—that of the battle of Waterloo, which was absolutely required to serve as a fixed point in chronology—history has not influenced in the smallest degree the determination of any length or height or angle, and yet from the Pyramid has been evolved a long series of events, the most important in the history of the world since the beginning, more than two thousand five hundred years ago, of the Times of the Gentiles, viz: the era of Nabonassar, the fall of Nineveh, the union of the crowns of Media and Persia under Cyrus, the very day of the accession of Alexander the Great, the birth of our Blessed Lord, and his crucifixion, the birth of Mohammed, the taking of Jerusalem by Omar, the battle of

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KEY TO DIAGRAM.

GRAND GALLERY.

1.—Whole height above step, 66.6″ × 5 = 333″.
2.—" Pivot " height, 66.6″.
3.—840″ height of step.
4.—833.333″ to floor line.
5. 826.85647″ = 28 lunar months = height of ramp.
6.—803.802755″ height to foot of step.
7.— 6.666666″ / 29.5305885″ } 36.197255″ full height of step.
8.—Floor line extended to level of ramp, 1866.1926″.
9.—1814.161616″ to foot of step.
10.—1895.8578 length of floor produced to level of step.
11.—Ramp.
12.—26° 18′ 0″.
13.—North end of Grand Gallery.
14.—23. 053728″ height of ramp.

GREAT STEP.

ab. South wall of Grand Gallery impending 1°.
aoe. Perpendicular from pivot to floor produced.
mn. Perpendicular from south end of roof.
gk = 36.197255″.
gj = 29.530588″.
jk = 6.666666″
gh = 23.053728″.
ad = 66.6″.
Angle of inclination of floor 26° 18′ 0″
Angle *dao* about 1°, or sine of *dao* = $\frac{7}{66.6 \times 6.}$
do = 1.1666″.
dk = 60.91726″.
dm = 5.833″.
mk = 55.08393″.

Inclined height of south wall 66.6″ × 5 = 333″.
Floor from foot of Gallery to *g* dates June 18, 1815.—Battle of Waterloo.
Floor to *g* + *mk* dates July 18, 1870.—Infallibility of Pope proclaimed.
Floor to *c* dates February 27, 1897.—End of Times of the Gentiles.
Christian Era, A. D. 1, April 20, Friday.—Birth of our Saviour.
Crucifixion, A. D. 34, April 20, Friday.
Floor from foot of Gallery to *f* dates June 29, 1867.—Celebration at Rome of Eighteenth Centennary of Martyrdom of St. Peter.

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Waterloo, the eighteenth centenary of the martyrdom of St. Peter, the fall of the Pope's temporal power and the proclamation of his infallibility.

"I have shown that the book of Daniel and the Great Pyramid are one, and that both point emphatically to 1897 as the termination of the Times of the Gentiles. Far be it from me to assert, that in that year 'the world will come to an end.' I look for that event to happen not before but after the millenium, and even then, when this world has been renovated and purified by fire, 'we, according to His promise, look for new heavens and a new earth wherein dwelleth righteousness.' But I do expect that in 1897 the Turks will have been expelled from Palestine."

This pamphlet from the antipodes, though short, (twenty-three pages), is evidently the result of deep study and research, and is well worthy of careful study by every student of the Great Pyramid and every advocate of the Anglo-Israel theory.

SYNOPSIS OF MR. COURTENAY'S THEORETICAL DIMENSIONS OF THE GRAND GALLERY (PYRAMID INCHES).

1. Height of step above the level of floor at entrance of gallery $=\frac{2520''}{3}=\frac{360x7}{3}$ = number of days in ⅓ of a "great year" =840.

2. Height of produced floor plane at the point directly below the "pivot" point of south wall of gallery $=\frac{2500''}{3}=833.333''$.

3. Difference of level between the latter point and the surface of step, 6.66".

4. Height from foot of step to the 833⅓" level of floor (2), =29.530588"=number of days in one lunar month.

5. Height, from base of gallery, of intersection of ramp with north face of step, 826.85647"=number of days in twenty-eight lunar months.

6. Angle of inclination of gallery floor, 26° 18′ 0″.

7. South wall of gallery is "pivoted" from a point 66.6" above the step, and

8. It leans over at an angle whose sine $=\frac{7}{66.6x6.}$

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9. Height of south wall above step measured on the incline, 66.6″x5=333″.

10. Length of gallery floor up to foot of step, 1814.161616″. This is the author's starting point in chronology, for he takes this to denote June 18, 1815, the date of the battle of Waterloo.

11. Floor plane produced strikes the level of step at a distance from the foot of gallery, which would indicate the date February 27, 1897. This is taken to mark the end of the Times of the Gentiles. The beginning of the Times of the Gentiles dates back two thousand five hundred and twenty years from this, or 625 B. C., when Babylon rose to empire; and the "midst of the week" coincides with the historical date of the taking of Jerusalem by Omar, in A. D. 637.

J. H. Dow.

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THE ARK OF THE COVENANT, THE PYRAMID AND FREEMASONRY.

"The Ark of the Covenant." Where is it? There have appeared in the columns of *The Messenger* several articles from the commencement, setting forth with a good show of probability that the Prophet Jeremiah brought the Ark of the Covenant with him from Jerusalem, which, no doubt, he did; but did he ever get further with it than the land of Egypt, or at the border thereof?" Jewish history fully agrees Jeremiah hid it somewhere.

We read in the volume of the Sacred Law, at the time of the Babylonian captivity, great clemency was shown to Jeremiah by the conquering hero, Nebuchadnezzar, and never was prophecy more literally enacted and fulfilled than when Jeremiah left Jerusalem, with the young and beautiful daughters of Zedekiah, and the treasures belonging to the temple, with many emblems most sacred to the children of Israel. I must, however, in a measure, take some exceptions to the received opinion of some, that the Ark of the Covenant will be found in the vaulted chambers of "Tara's mounds," county of Meath, in the north of Ireland. The whole province was renowned as a distinguished place. "The people of Ulster were more renowned and were distinct in race, religion and enterprise, and they were called Fir Bolgoes—that is, the 'Divine Felles.' Historians Tigermach and O'Flaherty say about the seventh century B. C. they were superior in architecture and wonderful in their skill and use of metals, tracing their skill and ability, wisdom and renown from the east, even among the Chaldeans, the Uhesdim, Uhesed, Trustworthy (or modern Freemasons). A part of the sixth and on through the fifth century B. C. "a great man appeared who virtually ruled Ulster, not as actual king, but the king had to acknowledge his authority." His name was Ollam Folla. He had a beautiful princess, Tea Tephi, with him from the east. Eochaid, the king, married her with great pomp and ceremony, changing the name of the domain where he lived, Lothain Croffin, to Tara, and by the ruling of Ollam Folla had the idolatry of the people changed to a pure worship, and in honor of Tea Tephi the renowned halls of Tara were built.

The conclusion, therefore, is, Jeremiah was the Ollam Folla, and he was the custodian of and brought many records and traditions with him of great value and priceless worth, with evidences of identity and renown, and many of them rest at Tara to this day, but that the Ark of the Covenant, the tables of the law and the tabernacle are buried or hid up there, in damp, vaulted chambers, subject to easy decay, I have considerable doubt. To make an assertion is one thing, but to give satisfactory proof to the contrary after the lapse of as many hundreds of years and history so obscure, is quite another thing.

I put forward an hypothesis last fall, to illustrate that the Ark of the Covenant was in the Pyramid, what position it occupied, and how it got there. I will now repeat what I then said, with still further evidences of a constructive character to give proof the Ark of the Covenant with its belongings was deposited in the Great Pyramid of Jeezeh in the land of Egypt. I will give good authority, if not proof direct, found in Maccabees ii, 4-8. In the Apocrypha of the Sacred Law, if it lacks inspired authority it has weight, we read: "It was also contained in the same writing, that the prophet, being warned of God, commanded the tabernacle and the ark to go with him, as he went forth into the mountain where Moses climbed up and saw the heritage of God, and when Jeremy came thither, he found a hollow cave, wherein he laid the tabernacle and the ark and the

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altar of incense, and so stopped the door. And some of those that followed him came to mark the way, but they could not find it, which, when Jeremy perceived, he blamed them, saying, as for that place, it shall be unknown until the time that God gather his people again together, and receive them in mercy. Then shall the Lord show them these things, and the glory of the Lord shall appear, and the cloud also, as it was showed unto Moses."

There can be but little doubt that this quotation has reference to no other than the Pyramid side, his climbing up the mountain. It might well resemble a mountain to those who had only seen the hills or small mountains about Jerusalem, and at this time the Pyramid had been built about one thousand five hundred years, free from damp or milldew, or indeed anything that would suggest decay. Moreover, Jeremiah, acted under inspiration, and perceived the opening in the side; for up to this time it had been used for astronomical observations without doubt. Let that be as it may, little skill would be required—after depositing such things as were necessary and not wanted whither he was journeying—to fit a stone in the cave's mouth, as it was called, and so defy the search of the after-comers to find the place of concealment. Would it be as easy to stop the mouth of a cave in the side of what our conception would be of a rugged mountain, and so defy detecting the closed door? I think not.

If we review this Pyramid question fairly, and extend our researches to the many probable significations applicable to the inside construction of the passages and chambers, apart from the intricate calculations of time and space so elaborately worked out by Professor Piazzi Smyth, F. R. A. S., and astronomer royal for Scotland, in his work 'Our Inheritance in the Great Pyramid,' I say, apart from these abstruse calculations, we may then in bewilderment ask how was the bottom part of the grand gallery constructed to give the information of its removal, and that by removing the sloping slab forming part of the floor to grand gallery it did reveal the entrance passage to queen's chamber, and again the question will arise, why so constructed? Every part so far has a direct meaning in geographical, mathematical and other proportions, yet this removal did not interfere with these calculations; that it was so constructed no one having made it any study will doubt, and the removal of all parts indicated were taken clear away, according to the original design of the architect or builder, little or no damage was inflicted on the adjoining parts. It next involves the question. when did these operations take place? I contend the quotation referred to gives very striking evidence in the direction of Jeremiah's deportation from Jerusalem to Egypt, in which direction he went, and being inspired by the Great Architect of the universe, he would be directed to a place of safety, for at least the more bulky portions, such as would be required or necessary, until the return of his gathered or chosen people, but the less cumbersome he no doubt took with him to the end of his journey, the north of Ireland, "the Gates of the Sea;" and there without doubt whatever evidence of identification he had with him he would most sacredly find a place for them, of close and lasting concealment, "until the latter days when knowledge shall be increased."

If Tara's Mounds should have been opened five hundred, or two hundred and fifty, nay, only fifty years ago, the characters, or hieroglyphics, could not, in all probability, have been fully deciphered. Be that as it may, the time is not far distant when great corroborative evidence will be forthcoming, the sanction may be obtained from the owners of the land, with the government authority, when such explorations will be made, and such indisputable testimony will be brought to light as will astonish the world. Having then ocular demonstration, with profound solemnity and reverence will these hid treasures of the past be acknowledged, and they will be the great agency to cause atheism, with all other isms, entire collapse. These evidences of Holy Writ will make the most sceptical yield, stand at bay, and in awe of such proof admit the past history of our ancient tribes and peoples as recorded in Holy Writ.

In my humble opinion Tara's mounds will be the first move towards identity proof.

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There is little doubt records will be found of such a nature as will open up the path for future development, the better for retracing the direction in which Jeremiah came to the shores of Ireland from the east, or the last place recorded of him in the land of Egypt, and there, in that land, will be unfolded the oracles of God and his dealings with his chosen people. The way is most marvelously opening before us by the stretched out arm of the Almighty, and his chosen people are the instruments in his hand to develop prophecy, which, when it has developed and become history, is discernible; and not until then can we poor, short-sighted mortals see what is our destiny. But we may look at that great mountain of stone and by its construction gain the information it teaches to the practical, operative man. There is much developed in the marked constructive formation of its several parts, showing very conclusively the position of the undiscovered chambers and what parts must be removed to arrive at their entrances, without in any instance marring the structional appearance of the original design. It could not be more adroitly constructed to give its own information, and I am fully convinced that Jeremiah climbed up the side of this mountain of stone and entered the Pyramid on the north side, then descended till he came to the junction of the first ascending passage, at which time a portcullis was constructed across, and in all probability facilitated a forward movement up the first ascending passage, the top of which gained, opens on to the grand gallery, at the foot of which he would halt on gaining an upright position. A consultation with his scribe, Baruch, and others with him would follow, thus moving and working under Divine influences, he would at once understand the sloping slab stone concealing the passageway to queen's chamber. When all was cleared away a straight passage would be gained for passing along the treasured oracles of Jehovah to an inner chamber elevated on the twenty-fifth course of masonry, which, after one thousand five hundred years, must have been free from all traces of damp, or any element to effect or promote decay. On entering the queen's chamber the deep recess in the east wall, called the niche, would not only be visible, but inviting to still further research in that direction. I am much inclined to think the table stone, and next one above, set far back, was not then in position, but ready prepared and placed aside for the purpose of forming a plug stone, after the treasures had been secured in a safe and sacred depository on the other side, when these plug stones could be worked in with struts and wedges from the opposite or west side; thus all would be secure till the appointed time for them to be brought forth, to accomplish which purpose construction most prominently presents itself of no ordinary character. Indeed, nothing short of inspired teaching could plan for the future and suggest to form a square hole on each side of the chamber, north and south walls, at such an elevation that a strong girder of iron could be inserted, and with proper appliances these plug stones could be mechanically drawn from their present positions without causing the slightest damage to adjoining parts. Some may say all this is chimerical. If it is, there is practical construction to confirm and lead up to every movement of the operative mason being complete being dispute.

Jeremiah would not extend his researches further than was necessary to prosecute the inspired designs entrusted to him, and would at once leave the dark recesses and have a stone fitted to the mouth of the pyramid "or cave," and when finished smooth with the outside surface would indeed be a question for the after-comers to cope with, and so it remained till the time of the forced hole of Caliph Al Mamoun, 820 A. D. Many have been the explorers since that time, particularly in the present or nineteenth century, most notable of whom is Professor Piazzi Smith, F. R. A. S., Astronomer Royal of Scotland, to whose work, "Our Inheritance in the Great Pyramid," the world is much indebted for its scientific erudition.

Let us now take another practical look inside, and closely trace and scrutinize the various parts made known to us by drawings and publications of most able writers and draughtsmen. We read that one hundred thousand men were employed twenty years

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on the building of the Great Pyramid. We can, therefore, picture them swarming like bees inside and out, the nature and extent of the work admitting and requiring both should advance simultaneously where practicable; thus the drilling, boring, cleaning off and polishing all work below the surface level, could proceed with equal energy with all going on above. When, therefore, these operations were going on below, including the subterranean chamber, the men would work very compactly together and ventilation would become a great necessity, hence the "well," or air shaft, situated as near central as possible. Its form and position would indicate no small amount of engineering skill, and its use would be apparent and its continuation would exist even beyond the closing in of the stone covering of the ceiling or summit of grand gallery, at the top west side of which is left the same rough hewn hole, continuing some unknown distance among the cross stones over ceiling of king's chamber, all of which continuous ventilation was practically and positively required during construction to enable so vast a number of workmen to perform their allotted tasks throughout all the various passages and chambers, together with the immense quantity of material and plant.

We will next review the grand gallery with the ramp stones, and endeavor, in a practical and operative sense, to arrive at, or define, the constructive object of the socket holes and other parts now veiled in allegory, apart from the exquisite finish and mathematical proportions and time measurements, which are thus built into fact. I say again, apart from this calculation great skill and ability would be required to construct these overhanging side courses of stone, each stone being set in an oblique position, causing a strain on each overlapping course of stone as it progresses upward out of a perpendicular. To enable the operatives to construct with security, it would be necessary to frame strong trusses supported on stanchions and these set into the socket holes in the ramps, or sets-off, and secured to blocks in side holes (now filled in) to keep all rigid and secure from any unequal thrust on the incline. All these supports were, no doubt, so constructed to afford a clear passageway under, for the different operatives to pass and repass to the various localities in and about the works, at the same time not to obstruct ventilation. We are not aware how much constructive caution was necessary in this gallery, while we are ignorant of the formation or position of the other passages and chambers, the which we will try to examine and endeavor to trace, by their construction, the information they contain, and what was the intention of the original builders, and what they wished to make comprehensible when the set time should arrive when all would be made plain, and the words of the Prophet Jeremiah made manifest: "The great, the mighty God, the Lord of Hosts is his name. Great in council and mighty in work, . . . which has set signs and wonders in the land of Egypt, even unto this day. (Jeremiah xxxii, 18-20.

On arriving at the top end of floor line to grand gallery we meet with an obstruction, this step stone, three feet high, and practically of no utility, and over which is the lowest and most inconvenient passageway thus far penetrated, we are led to ask why is progress impeded at this most important point, when it leads to such extensive measurement and detail; but on further examination and scrutiny through this low passageway, we stand in the anteroom, on a portion of the floor formed of hard granite, fitted and let down in its place between the additional thickness or side slabs that partly case in the walls of the antechamber, already set in position, it being so constructed that no difficulty would arise in again lifting it up. No doubt such was the intention of the Master Mason, its construction giving its own information, besides every facility being arranged for the undertaking. The grooves in the side slabs pass down below floor level, giving access for grappling irons attached to a strong iron bar, or a pair of sling chains could be fixed, and by the aid of the granite leaf and screw appliances, so raised as to be removed and disposed of by the workmen. My impression is under this stone will be found a cavity, the floor of which most likely will be found level with the bed of step stone. When this is removed, together with the stone under the granite leaf, a fair height will be ob-

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tained to passageway from grand gallery to antechamber, which floor line may follow on to king's chamber. I have little hesitancy in saying that there will be a far greater extent of exploration visible at the upper end of grand gallery than was found at the bottom end, under the guidance and direction of Jeremiah. The next removal, according to progress so far made, will be the removal of the granite leaf, and here we may say are most remarkable construction and forethought. If the granite leaf had been constructed in one solid stone, it would not give out in such unmistakable terms its own information. As it is, it serves several important purposes, and when taken out it will still be a record of the sacred cubit, the fifth part of a cubit and the limit of our English measure, the inch. Previous, however, to raising and taking out this granite leaf or strut, between the side slabs keeping them in position, it may be necessary to put in temporary struts of timber in the other groves. Such a precaution may not be necessary. The slabs, however, casing side walls, will have to be brought forward in whole or in part. This effected will reveal the entrances to the long hidden, mysterious chambers. There can be no doubt, if construction goes to prove anything, and these displacements are effected with that freedom of spoliation that its several parts would indicate, the size of the antechamber would be increased materially, and, as far as we can foresee, nothing would be marred or displaced connected with the main structure. These excresences being removed, much may be revealed; how much, it is not possible to say. But in view of the constructive parts, projections and obstructions, hinderances to locomotion when traversing the dark recesses from place to place, with those parts being separately formed, and placed, as it were, to cover some defect, or what would appear more rational, to conceal some secret formation in connection with the vast opportunity for some series of chambers most commodious in size. Again I might, in a structural point of view, make bold to assert there will be found a communication from the queen's chamber to those yet unexplored, thus a freedom of passageway and continuous circulation of air would be kept up for the craftsmen employed, which would not only facilitate passing to and fro, but would amount to almost a necessity when we consider the vast quantity of human beings breathing the same atmosphere in such close confined places, and having to perform their various handicraft, not only from day to day, but continuous from one year's end to the other, facing and polishing stone in all positions, that being a slow and tedious process under the most favorable circumstances, however, a continuous system of communication would be attended with great advantages, which are well known to those engaged on large and extensive works. The entrances to these communications, secretly closed, so far as we know, are hermatically sealed, the better for hid treasures; and if the oracles of God are concealed within, where, I ask, on the face of this terrestrial globe could any approximate receptary be found alike for preservation and safety.

Proceeding on, but still guiding our reflections into the most intricate windings of this most remarkable and scientific of all superstructions, we are led by our reflections to enquire; and it would be no great surprise to find another and a more noble entrance in connection with the other chambers hitherto unexplored, and the outlet (as was the north side) concealed from view. This must be left, however, to considerable speculation, nothing of a structural character giving any evidence of such important design, but the mind is led to think where so much skill and ability is present, more commodious and less cramped portals would be the chief considerations and characteristic of such huge proportions, unless for small, compact chambers, hermetically sealed, with passages of like nature, intended for development in after ages, but hitherto veiled in allegory, yet illustrated by symbols of most astute learning, philosophical research and deeply matured plans. Some of these plans suggest as little space as possible, should be exposed to atmospheric contingencies after all was complete and the workmen discharged. A few congregated now inside, the atmosphere soon becomes oppressive, as most tourists and explorers can testify. I may then safely ask, how would it fare with near an army of men

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inside, if ventilation had not been provided for from near the apex of the building, along grand gallery, down shaft by well's mouth to junction of subterranean chamber and foot of passage scheme as far as we know at present? And here another most important part of construction seems to present itself, and occurs in the incomplete subterranean chamber itself, and its uses.

It would be a practical question, where did the water supply come from to carry on such ponderous workings? Much water would be required for preparing and setting the stone. It therefore follows, in a practical sense, that the sinking down in the centre of the subterranean chamber was actually a well of water in those days. On the other hand, it could easily be kept full of water by a syphon pipe along the continuous sloping passage down to it. It being central would most accommodate all parts of the building with the least loss of time. But I think there was good reason to conclude there was a good supply of water at that depth in that distant age, percolating through the lower strata of rock, running from the fertile plains and rounding the edge of the rock on which the Pyramid stood, making its course toward the river Nile, and at the rising of the Nile a check to its course would be the consequence, and flooding the lower chamber would be the next result. Hence a stoppage of the work in that direction while in progress, while it enhanced the supply, which there is little doubt would be a periodical welcome, giving an opportune time for thorough washing off. Unless the reader has watched the operation of rubbing and polishing stone, no idea can be formed of the wet and sloppy performance, though in these days, in this age of chemistry, the surface may be softened and a large proportion of labor saved.

Apart from all other considerations, it will be seen that an early as well as ready supply of water would be in earnest request from the very earliest stage. Air and water would be the two principal elements first calculatd on for the due performance of such gigantic proportions.

In this practical illustration of the Great Pyramid and its several parts, I trust I am not taking undue credit for misconceived ideas, or egotistical enough to suppose I am advancing any new phase of the Great Pyramid construction; nor in the remotest degree ignoring the great scientific existing realities. Far be from me any such intentions, but to show the dignified prescience while framing such gigantic proportions mathematically, geometrically and arithmetically, that a design so profound in wisdom and learning gave out the conclusion that those occupied or so engaged at the head of the works were actuated by divine inspiration. So, therefore, all is delineated with such precision that even the constructive wants, facilities, with comforts of the craftsmen were not lost sight of, considering all of which, my hypothesis only adds to the innumerable proofs and undeniable facts of the practical construction of its vast designs now exposed to the view of the beholder, with those yet to be explored.

When those portions are removed that we have indicated according to the designs of the original architect, who, while constructing those supplementary portions, well knew they would not be disturbed though many long ages of time, and not then until all the remarkable fixed purposes of number, weight and measure were fully tested and made known to the world, so that all may understand and acknowledge that none other than the Great Architect of the universe did conceive and cause to be built into fact such cosmic proportions. No one can assert these sacred truths and known designs on the part of the architect were accidental. Every part throughout the whole structure of which is known 6r unknown, has a definite place and proportion, with a fixed purpose in the general plan. I am dealing alone with practical construction, as far as my idea of practical construction in connection with this building is concerned.

Leaving the grand mathematical researches to more exalted and able minds, some of whom figure conspicuously in the United States of America, THE INTERNATIONAL STANDARD being a bi-monthly journal having for its contributors some of the most able

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mathematicians known to science, I think enough has now been said in a practical point of view to enable those of us in any degree acquainted with the internal construction of the Great Pyramid to follow me into the chambers yet to be explored, and which I hope in due course will be opened and the hidden mysteries of nature and science brought to light. But however much we may feel we know in this, or, indeed, in any direction, it is as a myth compared to the will and intention of the designer of this "miniature world" in point of geodesic knowledge, and "stone Bible" in point of chronological order, and the ordained dispensation of our Heavenly Father, who has set and determined his purposes for all historical events, and when the appointed time arrives these unexplored chambers will be opened, and not before, by all the machinations it is in the power of mankind to put in force.

I hope on a future occasion to give the practical operative method of surveying and exploring those mysterious mounds at "Tara," in the county of Meath, North of Ireland, when Free-masonry will be the sequence to the programme.

THOMAS HOLLAND.

March 9, 1885.

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LETTERS.

LETTER FROM C. PIAZZI SMYTH.

15 ROYAL TERRACE, EDINBURGH, March 19, 1885.

Here is a most unexceptionable piece of Pyramid encouragement. I wrote to Egypt to inquire about the origin and meaning of the time signalling at Alexandria for the meridian of the Great Pyramid, and I send you a copy of the answer just received from Mr. James Hewat, by profession an accountant there, but better known here as a son of the late Mr. John Hewat, a merchant who was the effective originator, twenty-five years ago, of the Edinburgh observatory's time gun signals, as an addition to its time-ball signal of the true time; and ever since then we have kept up these two signals every day, check and check upon each other, through independent electric loops from the observatory clock, corrected daily by star observations the previous night. Now, just read his answer with all its well condensed and useful information. Is not the Great Pyramid asserting itself in these latter days? And at the crossing place of all the great highways over the earth, the time is now announced to the nations from the meridian of the oldest architectural monument of all mankind, the greatest wonder of the seven wonders of the world in the days of the Greeks, and the only one of them still existing! But how the advantage of that torch for all men, through all time, will be lost—if some of our over-learned few proceed to make up a system of weights and measures for the Anglo-Saxon peoples of the present and *future* times when they are to govern the whole earth out of their own abstract thoughts only, acting in subservience to the new fashion in natural philosophy schools of talking of kinetics and energy—as a sort of natural power to bow down to—and yet bringing out the Pyramid units and standards of measure, though without acknowledgement. But as the Great Pyramid, we acknowledge God and his Christ, and we must not be ashamed of that confession in our whole walk and conversation in life, and least of all when we are dealing with time, space, matter, the subjects of His creation. In the last letter from my Indian correspondent he remarked, on hearing of the fall of Khartoum, "now you will see events (Prophecies of Daniel) march quickly." And how quickly, too, they have marched, with Russia already at the gates of India.

Yours very truly,
C. PIAZZI SMYTH.

TIME SIGNALLING IN EGYPT FOR THE MERIDIAN OF THE GREAT PYRAMID.

ALEXANDRIA, EGYPT, 10th March, 1885.

My Dear Sir: I was glad to receive your letter of 14th ultimo., and have pleasure in giving you the following further information which I have gathered in reference to the lately adopted keeping of Pyramid time in Egypt. It appears that the originator of the idea is Lieutenant-Colonel Ardagh, C. B. R. E., who is at present stationed in Cairo, and has been in this country since 1882, when the war began. I must here state for your information that the British military authorities have here and in Cairo a time-ball and a time-gun in each city, while the Egyptian government has the same. What Colonel Ardagh wanted was uniformity of time for all. His reasons for the adoption of Pyramid time in preference to the Khedeviah Observatory at Abbassiah are, that the Great Pyramid has been employed by the French scientific expedition last century (or rather the beginning of this)

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as a meridian and also employed by R. E. Mahmood, Pacha, in his map of Egypt, and also because the Great Pyramid is the most enduring landmark in Egypt.

The actual observations of noon are taken at the Abbassiah Observatory by means of a transit instrument, and the meridian distance between the observatory and the Great Pyramid is calculated by observation and subtracted from the observatory time before the latter is signaled to Koom-el-Denas. At Koom-el-Nadura (Alexandria) the gun is fired and the time-ball hoisted 4′ 58″ before local time, the meridian distance between the time-ball at Koom-el-Nadura and the Great Pyramid being 4′ 58″. This has been adopted for the Egyptian railway and the telegraphic services. Colonel Ardagh further says the longitudes dependent on the transit of Venus stations are as follows:

	Hour	Min.	Sec.	
Signal Station, Alexandria	1	59	38	96
Great Pyramid	2	4	31	·6
Abbassiah Observatory	2	5	8	5

A telegraphic signal of mean noon meridian of Great Pyramid is sent to all stations from Abbassiah Observatory, which is 37″ fast of Great Pyramid time.

I am indebted to Captain Bloomfield, R. N., controller of this port, for the foregoing information, which I hope you will find interesting and accurate. With you I quite agree that this country has been roughly handled by those who professed to protect it,

And I am yours, etc.,

JAMES HEWAT.

To Professor C. Piazzi Smyth, F. R. S. E., etc., etc., Edinburgh.

LETTER FROM J. P. WEETHEE.

MILLFIELD, April 5, 1885.

The STANDARD of March, 1885, came to hand yesterday and its contents pretty well examined. You will please allow me to express my gratitude for the able and well written notice of the 'Coming Age.' I hope and trust that it will have an influence with your intelligent readers.

You will allow me to express myself freely on matters relative to the impending future. C. A. L. Totten's "Preface to the Study of Anglo-Saxon History," your article, "Unveiling of Isis" and the letters of C. Piazzi Smyth and Theodore Gribi have been very interesting—absorbing. I have read Hines, Wilson and others, relative to Anglo-Israel, and I do not hesitate to affirm that, except the advent of the Messiah, no subject can claim equal interest; and on that topic you will allow us to write, not that I can present anything new to you, but simply to give vent to a few thoughts that are pressing me for liberty of expression.

You are aware, perhaps, that I am writing a second work, "The Eastern Question in its Various National Phases," but are not informed as to its extent and peculiar features. It will be a book considerably larger than the "Coming Age," requiring a greater mental tax, since the plan of the work is somewhat new. I will now state, in a few brief words, what I have written, and what still remains.

(1). I have written the Egyptian phase, tracing its land and its population through all the periods of existence, to the future reign, pointing out God's mission with that people, past, present and future; and describing their position in the future conflict and reign.

(2). The British phase was then sketched. In doing this I went back on the track of that people into Northwestern Europe; then into Central Asia; and finally into Southwestern Asia, and showed their identity with the ten-tribed Israel; showed their past, present and future mission in re-establishing the Hebrew nation as king of the South.

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(3). The Russian phase was then examined. The origin and history of the Russian are fully given; his work and his adaptation to his work; his European home minutely examined, and the divine intention in all his movements; I traced his efforts to take Constantinople first from the Greeks, then from the Turks; and stated the causes of his repeated failures; and traced him in his present and future mission.

(4). I then examined the Ottoman phase of the Eastern question. That family was traced to its original seat in Central Asia, and their gradual progress south and westward. till they were established at Constantinople; showed their special mission and the reasons why the holy places have been in their power for so many centuries; showed their present and future mission.

(5). I then traced the Hebrew phase of the Eastern question. That family I traced from their origin through twelve epochs to their return, and reign under Messiah. I was particular to trace God's dealings and purpose relative to that people. This phase involves matters of great national interest; I demonstrate that family to be the hub of Messiah's great nation wheel. The writing of the Hebrew phase has cost me great labor, both in reading and thought.

(6). I am now writing the last, or American phase. I have now written about one-half of this phase. I have traced this American family from Columbus to the administration of Washington. Though I have all of our great libraries open to me, such as our state and congressional libraries, still much that I want cannot be found, such as its divine prophetic history. I am now writing on the Great Seal. I got some information from the Congressional library, and have written for more; also to Toronto, Ont. I search our State library. I have this to finish, also the preface and conclusion.

This book will involve all the great national issues of the day, and, therefore, cannot fail to command attention. My subjects are so vast, and the issues so overwhelming, that ordinary topics fail to interest me.

One great object of the book is to define the *true* Eastern Question; or God's purpose in the Eastern movements now in progress. It is quite evident that Jehovah and the earthly monarchs have not the same views of the world's government. The monarchs of the East have their own selfish ends to carry out, while God is working for his own glory, and that of his Son, Messiah. Which will finally be victorious, the Bible most emphatically declares, your unveiling of Isis is a grand thought; but I have to treat the growth, assimilation and the development of the new man of America, the Americanized Anglo-Saxon, in another way. I think that you will be satisfied with my positions. If I had Mr. Totten's idea of the seal it would help me, otherwise, I will get the facts and draw my own conclusions. If you can help in any way I shall be very thankful. Write me.

Yours,

J. P. WEETHEE.

LETTER FROM JAMES SIMPSON.

15 PALMERSTON ROAD, EDINBURGH, March 7, 1885.

I am deeply indebted to you and to the International Institute for sending me, from time to time, copies of the valuable STANDARD of your society and other printed and written communications bearing on metrology and kindred subjects. No student of Great Pyramid science in this country can afford to be ignorant of the important developments which it is receiving at the hands of our American cousins, especially as borne witness to in the pages of your bi-monthly STANDARD; and that I may not lose the instruction to be had from its varied contents, I must ask you to be so good as enter me as a subscriber thereto.

It may be of some interest to you to know that a "Scottish Geographical Society" has been this winter inaugurated in Edinburgh, and I have much pleasure in sending you

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herewith a copy of their first report and the opening number of 'The Scottish Geographical Magazine.'

The enclosed Pyramid notes relate to some matters which have already been discussed in your pages. Wishing you all prosperity, I remain,

Yours sincerely,

JAS. SIMPSON.

LETTER FROM JOSEPH BAXENDELL.

April 24, 1885.

The prophetical indications of the Great Pyramid have been abundantly borne out by the events of the last few years, and there can now be no doubt that the first arrival at the south end of the grand gallery occurred in the spring of 1880, as I pointed out in the *Banner of Israel*, when the great and unexpected change in the feelings and opinions of the people of this country took place, which led to the placing in power of a government whose blundering, incapacity and utter want of moral courage have well nigh ruined the country and led to disputes and complications with foreign countries which threaten to result in a general European and Asiatic war. If such a war should occur, it may indeed be regarded as "the great earthquake woe," and "the time of trouble such as there never was since there was a nation," referred to in the prophecies.

Yours very truly,

JOS. BAXENDELL.

LETTER FROM J. L. DAMPIER.

LONDON, ONT., April 8, 1885.

The "Unveiling of Isis" is as deeply interesting and absorbing in its subject, especially as regards Manasseh, as Dr. Sciss' work, "The Gospel in the Stars," which carries us back to the "In the Beginning," a beginning for us mortals beyond which we cannot penetrate. All the science of geology and the learning unto which man has exalted himself, ignoring the words "except ye become as little children," have not been able to shake my belief as regards that first chapter of Genesis. Proctor says no sane man could read "Anglo-Israel." I wonder where he would assign those holding the above opinion. Darwin, with his "Origin of Species," and Egypt, with her "Races of Men," the "ape" and "Ibis," are specimens of the art of deception which can be traced to the master of all deceivableness, culminating especially in these latter days. This is certainly an age of digging up and of bringing to the light things that have been hidden. We all begin life with wondrous story books of giants, dwarfs, genii and fairies, the Seven Champions of Christendom, St. Michael and St. George encountering the Dragon or Satan, all ranking amongst the myths and having then no further bearing or meaning than the evanescent pleasures of an hour; but now in St. Michael and St. George the "Serpent and the Cross are plain." A symbol is a silent myth. What a solemn silence the Great Pyramid has kept from 2170, B. C., until now. The Gospel in the Stars before the flood, the written word for this age, and the Great Pyramid a symbol of the whole. As we ascend the ladder of life we enter upon "Classical Mythology" and "Northern Mythology." The following was and is the opinion of the learned men of this age: "The heathen mythology not only was not true but was not even supported as true; it not only deserved no faith but it demanded none." After reading "The Gospel in the Stars" and "The Unveiling of Isis," this opinion must be very much softened down and the myths of our younger days have a far different meaning and appearance in this Saturday night of our

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lives. Just as after a cloudy, dark day, at setting, the clouds lift and the sun flows in a stream of light over rock, mountain and valley, so in these, our latter days, a flood of light is being poured in upon us by divinely inspired men, as much so as those before or after the flood; for such words as "Anglo-Israel" and the Pyramid would never have entered into the heart of man to have conceived, sought out or hunted after unless divinely led; and further, being so intimately mixed up and interwoven in this written word that in many parts that word cannot be properly understood without a knowledge of these two subjects. The myths in "The Unveiling of Isis" fit as beautifully in their place and are equally truthfully applicable as the twelve signs of the Zodiac, and their accompanying decans portray the "Serpent and the Cross," the gospel in the "garnished" heavens, as Job calls them—those heavens in which appeared the "star" for the Magi. May we likewise see His star, fall down and worship. With regard to America, there is no doubt in my mind that it has been kept especially for Manasseh. We are "fifth monarchy" men, though not fanatics, as when they declared themselves in the time of Charles I. and Cromwell, they had hold of the true thread out of the Labyrinth, but blindness had happened unto them and they were before their time. But soon the "Stone Kingdom," Israel ten-tribed, shall appear, grinding the image to dust, and Ephraim and Manasseh shall be the chief amidst the thousands of Israel—our Saviour reigning in Jerusalem, the two sticks united, and His chosen people the *Kingdom of God on earth*, when a great and overpowering blaze of gospel light will be spread abroad. The gospel is proclaimed as a witness in every nation now; this is one of the signs given to us by our Saviour. Let us watch and pray that we be not caught asleep without any oil. To those who believe and delight in recognizing the hand of God in history, I have no hesitation in saying that the men who have brought up and searched out the questions of "Anglo-Israel," the "Pyramid," and "Unveiling of Isis," must have been directed and led thereto by a power working in them unknown to themselves, not a deceivableness of wickedness by which, in the latter days, many will be made to believe a lie—for the above questions have led many a one to search the Scriptures, to whom, skeptical before, they were a closed book. I say a power unknown to themselves, not like the known presence seen and spoken with by the patriarchs of old, but an inward feeling had been engendered by constant, earnest, daily prayer for guidance—a perfect wrestle with the angel. "I will not let Thee go, unless Thou bless me." For God never changes; He is the same now as then. One of the great sins of this age is the ignoring of God. He says he will be enquired of by the House of Israel. Are not the above questions deeply enquiring ones? Have they ever turned anyone from the path of duty? No, surely; but, on the contrary, have been a light unto their paths and a guide unto their feet; so that the very myths are crying out against those who will not hear His word; against those who made use of these very myths and zodiacal signs, hoping to overturn the Christianity of the "In the Beginning;" but they dared not go back to that "In the Beginning" and prove who put those signs in the garnished heavens, for if they had the ground would have been swept from under their feet. In this age the very stones are speaking, the sands of the desert are upheaving and the myths of Greece and Rome are loudly proclaiming that which has been hidden for ages in their midst, so that there is nothing hidden which shall not be disclosed and proclaimed from the tops of the hills and mountains and from the house tops. It is only now we are beginning to understand Job, that "He would show thee the secrets of wisdom that they are double to that which is," and that "with the ancient is wisdom," viz.: primeval man. Our boasted civilization and society are but in their infancy; pure Christianity can only bring them to their prime, and then only at the time of the millennium, when Christ reigns and Ephraim and Manasseh, with reclaimed Judah and Levi, are THE kingdom—"Thy Kingdom Come."

Yours truly,

J. L. DAMPIER.

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LETTER FROM J. R. SKINNER.

110 BROADWAY, CINCINNATI, April 28, 1885.

You know that I think your *Isis* a strange production, and I confess I do not know how to pronounce upon it. I do believe in the great prophecies of the Bible, and feel more and more convinced that we, in our day, are in the midst of some of their greatest fulfillments—palpably so. As, for instance, as to the fall of the papacy and the waning of the Mostem power, as also the preparing the way for the kings of the East. Now much of this kind of prophecy was certainly astrological, for it was made to answer to times; but how I do not know. Very much of your work does seem to fit as to the working of our nation's work in this grand drama, viz.: ours of the New World—and does connect the germs of rise in the grand current of the stream, viz.: Huss and Luther—then Isabella, etc., etc. Your general mode is that which the Orientals observed. In looking into spiritual causes they recognized pertinent facts on earth as guides and land marks of the spiritual influences. I think if a man be an attentive observer of history and the workings of the nations, with a sincere view to arrive at conviction, he will after a time be amazed at the new kind of life and spiritual world into which he will find introduction; and this, I think is your experience. To me your articles have all the charm of ordinary romance intensified by the above consideration.

I have made very remarkable discoveries in what I may call the Grecian branch of the Hebrew Kabbalah, and it seems to explain to me what has been a puzzle, as to the unfolding or development of the Christian dispensation, which is full of Kabbalah from among the Jews, who hold it so. The fact is that this Kabbalah of which we have discovered the secret keys, was the "last" or "final" or "great" mystery of each nation. The origin was not among the Jews or Hebrews proper, but with the long anterior Semitic people, who landed from somewhere at the head of the Persian Gulf and at the head of the Red Sea. I think the first people were the same with the old Americans.

J. R. SKINNER.

LETTER FROM F. R. WINTER.

DEMERARY, March 9, 1885.

I have taken much interest in your paper on the Unveiling of Isis, and see now that it does approximate on Anglo-Israel belief, and trust that you will soon see that your interest in America is inherited through Mannasseh, and I have no doubt that Mr. Hine's visit will lead to a clearer understanding on this point, for he is undoubtedly well posted in the Scriptural arguments on the point, and he may possibly bring Mr. Wood's attention back to this part of the great subject to which he and you, among others, devote so much valuable time. And the Scriptural guidance which can be adduced will strongly back up the mathematical proofs which are so commonly brought forward.

I note your criticism of Mr. Feilden's work. I have again tried my hand at a correlation of his views with the division of time by Esdras, as I believe it to mean, and the Bible version of the creation so as to coincide with astronomy of the Pyramid measures, and I send you the result. I take my own chronology from the date of the birth of Adam and Isaac and if it be necessary to satisfy a much longer period than a jubilee of years, that longer period, may be deduced from the subterranean measures. But I think the point is overstrained, for after all what we have to deal with is contained in the Bible history of our first parent, and it may be doubted if any further knowledge of pre-Adamite man is necessary for us beyond what we read in Genesis, and if it were, will not the 10,-800 from the creation of light, or its manifestation to our earth, cover the pre-Adamite ages, anent which no special revelation has been given to us. The above period is com-

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prehended in and seems necessary to complete the revolution, or semi-revolution, of the known precession of the equinoxes as marked by the Pleiades year, 2170 B. C.

Hoping this may find you in the enjoyment of good health and full of energy to continue your work, which I firmly believe has God's blessing upon it,

Yours in faith,

F. R. WINTER.

'The Word, the World and the Branch'—J. Leyland Feildens' Periods of Creation.
12 cycles of 600 years = 1 day.

	Years.	Days.	Cycles.	Years Anno Domini.
World created void and dark	3,600	½	6	.....
Light created or diffused	3,600	½	6	....
	.....	1	12	7,200 A. L.
Light diffused	21,600	3	36	21,600
Light—earth included in the solar system—first procession of the equinoxes	3,600	½	6	3,600
Fourth day from light	28,800	4½	54	32,400
Fifth day completed 3,600		....	....	....
Sixth day completed ..... 7,200 =	10,800	1½	18	10,800
Adam's era—from light	39,600	6	72	43,200 A. L.
Adam to Isaac—Pleiades year	2,116	....	....	2,170 B. C.
Isaac to A. D.	2,170	....	....	.....
A. D. to end of 6 cyles of 1,040 years	1,954	....	....	6,240
	45,840	....	....	.....
Millenial period	1,000	1	12	7,200
Period of darkness	3,600	7	84	50,400
	50,440	....	....	.....

By the Pyramid chronology from Adam to A. D. is 4,286.
By J. L. F.'s chronology 4,004 + 21 = 4,025.
Difference ——— 261.

*10,800 from solar system in calendar year, thus:
7,200
——— 18,000 is equal to ——— 17,741 solar years. Difference 259.

LETTER FROM J. N. WING.

NEW YORK, April 7, 1885.

I confess that I am not equal to the comprehension of the astrological phase of your articles, yet it is all so fascinating that I wish I might know more of the vast subject. In this last I was pleased to read about the 'May Flower,' and the first meeting—the Suffolk Resolves. You had told me of your researches in that direcrection, so much of your article was a pleasant remembrance. You must know that I, from my infancy, as it were, have held to the idea of *individual responsibility*—that is, that we are not beings born to a certain fixed existence, but rather, that we can, by individual effort—from the inate consciousness of which we may be possessed from *natural* causes, inherited or otherwise—expand or contract irrespective of any supernatural agency. I find it hard to believe that my horoscope has been cast, and that I am guided

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or led by the "star of my birth." It may be all so. I cannot say no. I trust that you will say with Tennyson:

> There lives more faith in honest doubt, believe me,
> Than in half the creeds.

I have not read Totten's article on "Anglo-Saxon History," but shall soon. That subject interests me greatly, and I intend to study it more. Not long ago I addressed the members of a little society, of which I am a member, on the subject of the "Lost Tribes," and I must say that I was surprised that only one person present had ever heard the subject treated as Mr. Hine deals with it.

We intend to stand by our guns, and keep the STANDARD floating.

Yours truly,

J. N. WING.

LETTER FROM C. PIAZZI SMYTH.

15 Royal Terrace, EDINBURGH, April 2, 1885.

Your March number of the STANDARD duly arrived, and a very good number it is. Good, also, the illustration, viz: the landscape birth-place of American United States liberty. Surely with that eventful scene before them, the sons of the heroes who figured there are not going to bow their necks to the yoke of French instead of their own weights and measures. Lieutenant Totten, in a recent letter, makes a magnificent remark thereon. He is grand and calm and Scriptural, and says he does not believe there is any danger of the French Metric system being made compulsory in the United States of America; and if there is a permissive regulation about it, it is merely akin to that other order given a long while ago, "let the wheat and the tares grow together until the harvest, and then"—. That harvest, he seems to think, may be much closer than many men expect. So, too, does my Indian friend, Mr. R. Courtenay, now to be addressed as Assistant Judge, Tanna, Bombay, a letter from whom arrived simultaneously with the other, and I send it on to you herewith, for I find it interesting and instructive from beginning to end. It is in a peculiarly original line, too, which will interfere with no one, but may light the way for many, and I remain

Yours very truly,

C. PIAZZI SMYTH.

IMPORTANT LETTER FROM R. COURTENAY.

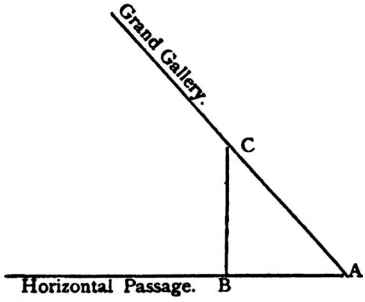
TANNA, BOMBAY PRESIDENCY, April 2, 1885.

TO PROFESSOR C. PIAZZI SMYTH:

I have been obliged, in the interests of truth, to append a short postscript to my pamphlet. It is still in the press, so I shall not be able, I think, to send off thirty copies to you until next week. Considering the storm of persecution from which you have not even yet emerged, I can quite understand your feelings in regard to these new departures in Pyramid interpretation; but you have fulfilled my only desires, which are that they should not sink like water into sand, but should form stepping stones to other and greater discoveries. Many thanks for the pamphlet, and also for the January number of the INTERNATIONAL STANDARD. I should like to become a member of the Institute I do not think they ought to put off much longer their expedition to the Pyramid. Egypt will probably witness many desperate battles before the end comes. They are allowing the present short opportunity to pass by.

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I had no idea when I wrote my pamphlet in what a sea of controversy I would find myself. Doubt still rests on the angle of inclination of the gallery, but in any case the area of controversy has been much reduced by the Pyramid. If the angle be 26° 17′ 4″, or less, then our Lord was born in the spring B. C. 1, and crucified in A. D. 33. If it lie between 26° 17′ 30″ and 26° 18′ 0″, then A. D. 34 must be the year of the crucifixion. It is strange how exactly this represents the present state of the controversy looked at merely from the Biblical and historical points of view. Many now contend, in opposition to the numerous and powerful arguments of Sir Isaac Newton, that B. C. 458, and not 457, was the seventh year of Artaxerxes, 490 years from 458 bring us to A. D. 33. Then looking at the day of the week and lunar month, fourteenth Nisan in 33 A. D. was a Friday, and fifteenth Nisan in A. D. 34 was also a Friday. The date of Waterloo will remain as a fixed point, and the change of a year in the date of the nativity would push forward the taking of Jerusalem by Omar only sixteen or seventeen days. I have been endeavoring lately to ascertain the exact angle of inclination of the gallery by calculating its effect on the numbers in the horizontal passage and the queen's chamber. I make use of a method which you unconsciously adopted at one place in 'Life and Work,' viz: to consider the grand gallery the great chronological scale of this dispensation and to interpret numbers in the horizontal passage and queen's chamber by finding the corresponding lengths along the line of the gallery.



For example, instead of A B read A C; in other words, divide A B by cos. 26° 18′ 0″.

I send you by this mail a little pamphlet, "The Flight into the Wilderness," which I brought out some years before my eyes had begun to be opened to the connection between the Pyramid and the Bible. You will find two dates:

260 A. D.
1260

1520 A. D.

Now, measuring along the grand gallery you found that the passage finally left it at 262.6 British inches from the north wall:

262.6
1260

1522.6=very length (given in 'Life and Work') of passage. But this is a rough agreement. Such will probably not satisfy you. I, therefore, proceed to apply my method: Considering the roughness of the floor and its beginning, and that the passage is not quite horizontal, a little more latitude should be allowed to me than in the grand gallery. At the distance 1303.3 British inches (equals 1302 Pyramid inches) from the north wall there is a sudden descent. 1303 A. D. is a most unpromising date. Historians tell us of no remarkable event in that year. But now allow me to call it 1301.82 and find the corresponding length along the grand gallery. 1301.82÷cos. 26° 18′ 0″=1452.13=(counting from April 20, A. D. 1, and allowing for error caused by Julian

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reckoning) May 29, 1453=date of taking of Constantinople by the Turks, leading to great diffusion of the knowledge of Greek over Europe, hence Erasmus' Greek Testament and hence the reformation :

Now length of horizontal passage to jamb in queen's chamber=1522.6 British inches.

1.5

1521.1 Pyramid in.

Allow me to call this 1520.8. 1520.8÷cos. 26° 18′ 0″=1696.4=(counting from Apri 20, A. D. 1,) September 20, 1697,=date of peace of Ryswick=(vide 'Grattan Guinness' appendix page 655) 'End of Sanguinary Conflicts and Full Establishment of Civil and Religious Liberty in England.' With the peace of Ryswick ended religious wars in Europe. Not merely this, but Revelation xi, 14 connected this date with the termination of the Turkish woe. Now, on September 11, 1697, at Tenta (in the same "hour," *i. e.* "fortnight"), Prince Eugene annihilated the Turkish army. Since then the Turks have fought for bare existence. According to Revelation ix, 15, the woe lasted 1 year+1 month+1 day+1 hour=(365+30+1) years+16 days.

Battle of Tenta, 1697 September 11

395 14

1301 August 28

Now, according to Van Hammer, the great historian of the Turks, their first Sultan, Othman, made his first descent on the Byzantine empire—in fact the Turks commenced to be a predatory horde—in midsummer, 1301 A. D. —. Obviously in making such an investigation it is most desirable to have before you as many sets as possible of independent measures. In order to obtain Petrie's measures I ordered out his book from London, but I heard, after waiting several months, that it was out of print. If you think them worthy to be used as measures, I would be greatly obliged if you would copy out for me on a postal card his values of the (1) angle of inclination of the gallery, (2) the length of the horizontal passage, and (3) the length, (4) breadth, (5) height, and (6) and (7) diagonals of floor of the queen's chamber. I should like to hoist the engineer with his own petard.

I am

Yours very sincerely,

R. COURTENAY.

LETTER TO PROF. C. PIAZZI SMYTH FROM JAMES M. DURKEE.

PITTSFIELD, MASS., March 21, 1885.

Dear Sir: You will pardon me, a stranger, in the liberty I take of addressing you. I am reading and *thinking* your book, 'Our Inheritance in the Great Pyramid.' It has awakened in my mind a deep interest, and thoughts come like great billows from the ocean. I want to thank you for that book, although I am not an educated man, only a *printer*—once a poor boy—but for twenty-five years of *business life* the *Word of God* has been the *light of my pathway*, and I most firmly believe that "the invisible things of Him from the creation of the world are clearly seen, being undersood by the things that are made."

I desire in this communication to call your particular attention to the remarks you make in regard to the "*50th course* and the total height of that structure," or 1,690 inches, and the level of the floor of the king's chamber," Does this have any connection with the date of the deluge, which is placed at 1,657. Are not the inches you give the true *line mark* of that wonderful event only 33 inches or years difference? Will you please notice this remarkable instance? And, second, *the first course* of the king's chamber is a "*tenth part*, nearly, taken off the height of the lower course by the manner of the introduction

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of the floor!" does it not completely solve the mystery of the 10? *Ten patriarchs!* Noah, the *10th* before, yet reckoned the *1st* after the flood! Does not this explain "the significant 5 × 5, and 10 × 10 *100* stones, and can we not say whose "image and super-

The granite has particularly attracted my attentionl the *symbolism* of which is generally understood when connected with 7. Finally, I believe this Great Pyramid to be the symbolical witness of God "declaring the end from the beginning."

May I hope to hear from you in relation to the two points herein suggested, and may our kind heavenly Father, God of all, give you more wisdom and length of years to reveal his power.

Yours very truly,

JAMES M. DURKEE.

LETTER FROM S. BESWICK.

STRATHRAY, ONT., April 6, 1885.

Sir: Magazine came to hand rather late. This number has some interesting papers in it. The frontispiece of the birth-place of American Liberty is a valuble relic to be prized, and is an appropriate illustration for your article on "Isis," which (from its literary features) to my mind is one of the best, if not the best, paper published on that theme.

In regard to Mr. Wood's article on the E. N. E trench and the obliquity of the ecliptic, of course, I like the article, and its main drift accords with my own theory, but Mr. Wood's theory falls far short of the actual use and purpose of the E. N. E. trench. In an article of mine on pages 254-256 I have indicated a few of the features, as hinted at by Petrie himself, of the purpose and meaning of the trench. But the E. N. E. trench Petrie has missed its meaning altogether. Mr. Wood's theory that this trench was used as a "time indicator" of the variable obliquity of the ecliptic is a little exaggerated and inadmissable; because that theory would imply the long, continuous *usage* of the trench for centuries, and does not accord with the *blocking up* of the Pyramid passages and the entrances immediately the Pyramid was built. The three great trenches, no doubt, have an astronomical bearing on the work and design of the Pyramid. But that astronomical bearing and use would cease with the erection of the Pyramid, except in some subordinate sense, as a relic of what it had been. This objection would only apply to the case as a permanent institution, and as a sort of observatory. There can be no doubt that the basalt pavement, with the three trenches, was used as an observatory of a very high order of perfection during the work of constructing the Pyramid. But Mr. Wood's article is an admirable piece of close reasoning, and very scrupulously confined within the limits of known fact and established astronomical data.

I am glad to see the basalt pavement coming into prominence, because I believe that you will find that it is the true *level of the Pyramid's pavement*, as I have before intimated. These trenches furnish a demonstration that the pavement's level was 41.2529 inches. But I will take this matter up at some future time.

I read Professor Smith's letter with interest. I agree with him that Professor Rogers would do us an immense service if he would take a rod of black marble, or *flat ruler*, and put his microscopic scale upon it, as black marble is the least expansible from heat.

The extract from the consul's letter to the Secretary of State is very explicit and definite, and the restrictions are reasonable and even desirable, provided the Khedive will look well after the old walls, temples, etc., and stop the *native* from *despoiling* as well as the *foreigner*.

S. BESWICK.

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LETTER FROM JAS. SIMPSON.

EDINBURGH, December 12, 1884.

My Dear Sir:—I am sorry that in writing to you on Wednesday I was so forgetful as to omit reference to a small matter that has come under my notice, and may (I do not know) have some Great Pyramid significance.

The silver coin which our bank receives from the mint is put up and sealed in £100 bags of half-crowns, florins, shillings, etc., as the case may be, and each bag has a mint label bearing the weight in ounces and (as I conceive) hundredths of ounces. I enclose one of these labels and add a note of weights taken down from several others, from which it appears that the mean of all is (if the fractions are hundredths) 365.293 ounces Troy, as thus:

Florins,	365.16
Florins,	365.10
Florins,	365.15
Half Crowns,	365.90
Half Crowns,	365.35
Half Crowns,	365.10

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365.293

I am unable meanwhile to make a larger selection, but such as it is, it comes strangely near that fundamental Great Pyramid number, 365.24, and one cannot help thinking the coincidence is as little accidental as in the remarkable cases of the weights of the United States of America single coins. Judging even from the entries made above the weight, 365.90 would seem to be quite exceptionally high, and if it were omitted there would come out a mean of 365.172 only. It might therefore quite well be that the general mean would lie very close to 365.242.

Yours very sincerely,

JAS. SIMPSON.

PROFESSOR C. PIAZZI SMYTH,
15 Royal Terrace, Edinburgh.

THE GREAT PYRAMID.

Thou Word of God materialized in stone,
Sculptured programme of the Heavenly drama;
When wilt thou manifest thy purpose here,
With zephyr-voice proclaim thy mission to the world?

G. VOGLESANG.

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TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

MARCH 25, 1885.

Hugo Friedrichs, Gotha, Germany, and W. C. Jones, of Cleveland, were elected members.

A piece from the coffer of the king's chamber of the Great Pyramid was exhibited. It is of red granite, highly polished, and is similar in appearance to specimens from the Temple of the Sun at Heliopolis, Pompey's Pillar and Cleopatra's needle.

Letters were read from Rev. H. G. Wood, upon the Egyptian cubit preserved in the Turin Museum; from Professor F. Hess, on the late eclipse; from Rev. E. P. Ingersoll, on the identity of Israel with the Anglo-Saxons; from Professor W. A. Rogers, on the standard yard bar, which he is making for the society; from Professor A. Abbott, criticising Mr. Beswick's paper on "Metrology of Coins or Values." A paper by Mr. James Simpson of Edinburgh, Scotland, upon the "Pyramid and British Inches," was read.

A paper sent by Commmander S. R. Franklin, of the National Observatory at Washington, was read. It contained communications concerning the proposed change in time for beginning the astronomical day. The conclusion of the department is that notwithstanding the fact that England has made the change beginning the astronomical day at midnight, corresponding to the civil date, the United States Naval Observatory will make no change until the ephemerides are constructed in accordance with the recommendation of the recent International Meridian Conference.

A pamphlet sent by Professor C. Piazzi Smyth, and written by Mr. R. Courtenay, of the Bombay civil service, was discussed. The work is entitled "The Two Witnesses—The Bible and the Great Pyramid."

A notice was given of a very interesting work which has lately appeared, confirming the theory of the late Abbé Moigno, a distinguished member of our Institute. It is entitled "The Store City of Pithon and the Route of the Exodus," by Edward Neville, of the Egyptian Exploring Fund. An interesting paper from H. W. Oswald, entitled "Ho, for Palestine," was also received and acknowledged.

APRIL 8, 1885.

In the absence of the president, Dr. Redfield occupied the chair. The members elected were George S. Gatchell, Buffalo, New York; G. A. Kraft, Fredericktown, Ohio; Dr. Joseph Mason, Jackson, Tennessee; John H. Weldon, Kilmallock, Ireland, and James Simpson, Edinburgh, Scotland, life member.

Professor C. Piazzi Smyth wrote with reference to the adoption of Great Pyramid time by the Egyptian government. Letters were also received from Mr. James Simpson on "Coinage," from Professor A. Abbott and Mr. Eli Baldwin on "Ancient Coinage," from Mr. J. L. Dampier on "The Fulfillment of Prophecy," and from Mr. F. A. R. Winter on "Periods of Creation."

After discussion upon the Great Pyramid as a prime meridian for the world, the meeting adjourned for two weeks.

APRIL 22, 1885.

At the meeting Mr. Edward Hine was elected a life member. Letters were read from Professor C. Piazzi Smyth, James M. Durkee, S. E. Massey, J. L. Dampier, J. N. Wing, Alfred E. Watkins, William E. Brown, Henry Kellogg, Dr. E. M. Epstein, J. P. Weethee

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N. F. Safford, Samuel Beswick, Professor I. N. Vail, Rev. J. Upjohn, W. K. McAllister, Jacob M. Clark, J. M. Goodwin.

Arrangements were made for the lecture of Mr. Edward Hine of London, the English apostle of the theory of the Anglo-Saxon race being identical with the lost ten tribes of Israel.

Mrs. A. M. Searles read a translation from the work of M. Lecointre, an engineer engaged by M. de Lesseps in the construction of the Suez canal, entitled "Campaigne of Moses," throwing a new light upon the route of the Exodus and the actual point where it crossed the Red sea.

A very interesting paper, by J. Ralston Skinner, on "Hebrew Metrology," was read and illustrated on the blackboard by Mr. Latimer. An able review by Mr. Hess, in the *Fort Dodge Chronicle*, of the INTERNATIONAL STANDARD was also read.

The meeting adjourned for two weeks.

MAY, 6, 1885.

The members elected were: Fred Bishop, Akron, Ohio; John H. O'Mara, New Lisbon, Ohio; George Leach, Riverside, California; and Charles de Medici, New York. Communications were read from J. H. Weldon, Kilmallock, Ireland, on the "Reverse of the Seal of the United States;" from Joseph Baxendell, astronomer, England, on "The Prophetical Indications of the Great Pyramid as Exemplified by Recent Historical Events;" from Theodore Faber of Brooklyn, on his "Value of Pi;" from J. R. Skinner and Henry Pierrepont, and from Alfred E. Watkins, the engineer who proposes to explore the Pyramid by means of diamond drills.

The president acknowledged the receipt of a poem on the Great Pyramid by Mrs. Thomas Bassnett of Jacksonville, Florida, which will be read at a future meeting. A book entitled "Freemasonry from the Great Pyramid of Ancient Times" was also received from the author, Thomas Holland of London, England.

Mr. Latimer illustrated by blackboard diagrams a portion of the work of Mr. R. Courtenay, "The Two Witnesses—The Bible and the Great Pyramid."

In his introduction the author says: "During the rainy season of 1879 I was stationed at Alibag, a little town on the western seaboard of the Bombay presidency. The rain fell so constantly that there was no inducement to leave the house. The society of the station consisted of four Europeans. Under these circumstances I was led by a pamphlet I found on the colletor's shelves to the study of the prophetic scriptures. The Bible forthwith became a new book to me; my eyes were opened to the coming glories of the Messiah's reign on earth, and from prophecies fulfilled to the letter in the past I learned to venerate the literal words of Scripture. In the following December I met at Lahore a gentleman, at once a Christian and ardent Freemason. He put into my hands "Our Inheritance in the Great Pyramid," with the earnest request that I would devote myself to the task of proving that the Great Pyramid is, in its prophetic portions, in perfect harmony with the book of Daniel and the Revelation of St. John. Many persons are under the impression that numbers may be manipulated to any extent, and made to prove anything; probably if they themselves made the attempt they would change their opinions. My experience certainly does not confirm their view. My discovery of the prophetic periods of Daniel was not made until many mc ths had elapsed, and from July, 1880, until the later part of 1884 I was quite unable to etect any agreement between those periods and the chronological measur of the Pyrai id. Often after covering pages with calculations have I cast them aside in utter dis. atisfaction, and thought for the moment that this Great Pyramid was a mere will-o'-the-wi ı to lure men into endless quagmires of unprofitable speculation. But lately a study of the measures most neglected, namely, of levels, has led me to the true solution." He then shows the correlation between various historical dates and events and the measures of the Pyramid. Upon these Mr. Latimer commented.

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Mr. Edward Hine then gave a short address on the Identity. He congratulated the Institute on its existence and the work it was accomplishing. He said that he had no fear that the French metric system could ever be adopted by the Anglo-Saxon race. The fact that they were Israel rendered it impossible. The perfect and just weight and measure were only given to one people on the face of the earth, and the possession of those weights and measures by our race was one proof of our identity with Israel. But one proof was not sufficient, and the speaker pointed out many facts showing the identity of the race. He believed the separation of America from England was a fulfillment of prophecy, and stated that he thought there must be a mark to testify to that separation in the Pyramid.

At the conclusion of the address a vote of thanks was tendered to Mr. Hine for his instructive remarks. The thanks of the Society were also given to the Cleveland Choral Society for their kindness in rendering several fine selections from oratorios at Mr. Hine's lecture in the Tabernacle. The meeting then adjourned for two weeks.

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EDITORIAL NOTES.

Able papers from Professor Asahel Abbott, Rev. James Upjohn, Dr. Watson Quinby, Mr. F. Hess, Rev. E. P. Ingersoll, Mr. W. E. Bond and others are held over for a future issue.

Our thanks are due Mr. Samuel C. Goodsell, of Westville, Connecticut, for copies of his pamphlet, entitled 'A Book of Stubborn Facts. Trigonometrical Science, as viewed from a Practical Standpoint.' The work is dedicated to the International Institute for the Preservation of Anglo-Saxon Weights and Measures.

We must again apologize to our readers for the delay in the appearance of the Magazine. It is due to a casuality in the printing office. We trust that no one will think on account of the late issue that publication may be suspended. We intend "to keep the STANDARD floating." We have to contend with many difficulties, and we trust that all our friends will help us, if it is in their power, with money; if they cannot assist pecuniarily, that they will endeavor to interest others and increase our circulation.

We desire to call the attention of our readers to the work in this city of Mr. Edward Hine, the English lecturer on the subject of the Identity of the Anglo-Saxons with the lost ten tribes of Israel. Mr. Hine is the author of a book called 'The Forty-seven Identifications,' which has had a very large circulation. He has twice lectured in the Tabernacle to large and attentive audiences, and also in many of the churches of the city and in several private houses. He has succeeded in awakening a deep and growing interest in his theory.

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"The Unveiling of Isis" will be published as a book as soon as a publisher can be selected. It will be illustrated by a number of planispheres and other engravings. It will contain twice the amount of matter already published, giving special details and explanations and throwing light upon the mysteries of heathen mythology and primeval astronomy, showing especially their connection with the history of our country and our race, or the Anglo-Saxons. This book will be published in the interests of the International Institute, and we trust that our members will send in subscriptions so that the work may be forwarded.

We have received from Mr. Alfred E. Watkins, a mechanical engineer of New York city, a prospectus of a proposed expedition into Egypt to thoroughly explore the Great Pyramid of Gizeh, by means of the diamond drill. It is proposed to fully equip a party of engineers for a stay of several months at the seat of operations. These engineers, in addition to the usual outfit provided for such expeditions, will be furnished with a diamond rock boring drill and compresser, a small steam boiler and appurtenances, suitable pumping apparatus and an electro-dynamo. Mr. Watkins considers that thirty-five thousand dollars will be necessary to meet the expenses of the undertaking. It has been thought best to raise this amount by subscription, dividing it into shares of thirty-five dollars each.

We have received a communication from a very earnest member of our Institue, stating that in the opinion of the writer some of the views set forth in the "Unveiling of Isis" are blasphemous. We sincerely regret that the religious sentiments of anyone should have been wounded. We approached the subject with reverence and with an earnest desire to uphold the truths of Scripture, and we believed that in the myths of the ancient world would be found a confirmation of those truths. We trust that when our work is completed and our design fully manifested that any who may have felt offended will see that what we have written will not tend to destroy, but to strengthen faith and reverence.

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REVIEWS.

We desire to call the attention of our readers specially to the work of Mr. R. Courtenay of Bombay, India, entitled 'The Two Witnesses—The Bible, the Great Pyramid,' of which Mr. Dow has given a short synopsis in the present number of the Magazine. Professor Smyth says of the book: "It is a beginning only, but a splendid beginning." It is remarkable that Mr. Courtenay should have verified one grand date in the history of our race, probably the turning point in the history of the Anglo-Saxons, namely, the date of the battle of Waterloo, represented by the foot of the great step, or 1814+ for the beginning of the grand gallery. This was the time of the overthrow of that monarch who may be called the Apollyon of Revelation, he who went out conquering and to conquer, the first monarch who ever put his name to a decree authorizing the French metric system, and with sword in one hand and that balance in the other, went forth to overthrow the armies of Israel, and was defeated, exiled and imprisoned at St. Helena, by the people whom he hoped to conquer and give them his false measure. The attention of Pyramid students should be directed to the verification of this particular date, after which the rest may be comparatively easy.

We wish to acknowledge the receipt of a remarkable book called 'Freemasonry from the Great Pyramid of Ancient Times,' by Thomas Holland of London, England. It is illustrated by a number of engravings of the Pyramid remarkably well executed. Mr. Holland has written this work for the purpose of proving to his brother Masons the value of the Great Pyramid. He says: "Viewing the past history and traditions of Freemasonry, together with the signs, symbols, allegories and scientific teaching, illustrated by and compared with the sacred writings, on which the whole of our ceremonies are based, we

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are at once led to acknowledge there is something of reverential awe in its deep researches and hidden mysteries, which from time immemorial have been passed along for our instruction and guidance throughout every age and country, from the great seat of learning and wisdom, tracing back to the land of Media among the Chaldees."

The writer of this review is not a Freemason, nor has he any prejudices against Freemasonry. He believes that it has in its keeping important secrets concealed from the time of the beginning of the order to the present time, which is the time of the sea giving up its dead, and that the grand secret which it possesses has come down to bless the whole human race. He has, then, no prejudice against the order of Freemasonry, but he has no admiration for men who join that order as time-servers, or position seekers, as men have sometimes joined the church. An esoteric Mason is a deep student of all the mysteries, and especially of those that are divine. An exoteric Mason is one of whom the apostle says, "They are not all Israel that are of Israel," but occupy the outer courts, and probably many will never enter the holy of holies. Our study of Freemasonry has given us an insight which enables us to say this in its defence, but there is as much need of an Ingersoll in that order as there is in the church to overthrow shams. Mr. Holland's book will tend to uplift the Freemasons' work and take it back to its true origin, for Bunsen says that the Pyramid was called *AOR*, which is light, and in ancient times Freemasons were called the Sons of *Light*. And now has come the time when the secret of the order, which even the most esoteric Mason of the day does not understand, shall be revealed. Mr. Holland has made a grand beginning, and we heartily recommend the book to all of our members.

The book is printed by R. Folkard & Son, 22 Devonshire street, Queen Square, London, W. C., England. It may be ordered by Cobb, Andrews & Co. or by Burrows Bros. & Co., Euclid avenue, Cleveland, Ohio.

THE RESTITUTION, issued weekly by the Christian Publishing Association, Plymouth, Indiana. Terms, two dollars per year, payable in advance.

The Restitution advocates the final "restitution of all things

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which God hath spoken by the mouth of all His holy prophets since the world began." As a means to this end, the establishment of the Kingdom of God on the earth, with the Christ as King of kings, the restoration of Israel, the literal resurrection of the dead, the immortalization of the righteous and the final destruction of the wicked, eternal life only through Christ, and many other kindred truths.

I. 'The Coming Age: Its Nature and Proximity.' The nature of the coming age is fully discussed as to its physical, moral and political character. In establishing the proximity of that age, the prophecies of Isaiah, Jeremiah, Ezekiel, Daniel, Zechariah, Christ, Paul, Peter and John, in his Apocalypse, are fully examined. Their Hebrew and Greek originals are compared, and their testimony critically noted relative to its rapid approach. It forms a complete text book of those prophecies which relate to a future age. Price $3.00. Send to C. H. Jones, 77 Clark street, Chicago, Ill.; to the Restitution, Plymouth, Ind.; or to J. P. Weethee, Millfield, Athens County, O.

'THE GOSPEL ACCORDING TO ST. MATTHEW.' Translated from the Greek text of Constantius De Tischendorf and other standard textual anthorities. By Charles Gardner, M. A. Printed on extra heavy, tinted paper, elegant cloth binding. Post paid, only sixty cents.

As the object of publishing this gospel was merely to show the style and design of the whole work, we will allow all those who purchase this book at sixty cents this amount of discount on the price of the whole New Testament when completed. C. H. Jones, 77 Clark street, Chicago, Ill.

'THE NUMBER COUNTED 666, AND THE NAME COUNTED 888.' By the Rev. James Upjohn.

These books investigate the numerical values of names in the Hebrew Scriptures; they are companion volumes, price one dollar each. They will be sent postage paid by remitting the price to Rev. James A. Upjohn, Neenah, Wisconsin.

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'The Waters Above the Firmament, or the Earth's Annular System.' The book will contain about four hundred neatly bound octavo pages, and will cost not more than two dollars by mail, possibly less. If the author can obtain one thousand pledges, he will publish the volume. No money asked for till the book is ready for delivery. Address Isaac N. Vail, Barnesville, Belmont county, Ohio.

The Messenger—A weekly journal devoted to the elucidation of prophecy and the identification of the British nation with the house of Israel, God's chosen people, his inheritance. Edited by Annis Unwin, 84 Oxford street, Sheffield, England, and published by John Heywood, 11 Paternoster buildings, London, E. C., England. Yearly subscription, 10s. 10d.

The Banner of Israel—A weekly paper advocating the identity. Edited by Philo Israel and printed by Robert Banks & Son, Racquet court, Fleet street, London, E. C., England. Annual subscription for one copy weekly, including twelve double numbers, post free, 7s. 6d.

Israel's Hope and Destiny—This magazine, which has been published for five years as a monthly, will henceforth appear as a quarterly. It advocates the identification of the Anglo-Saxon race with the house of Israel. The editor is Douglas A. Onslow, J. P.; publisher, Robert Banks, Racquet court, Fleet street, London, England.

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MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD FROM MARCH 15TH TO MAY 19TH.

March—J. G. M. Hursch, $2.00; Rev. E. P. Ingersoll, 35 cents; Thomas Basnett, $5.00; Mrs. S. R. Prentiss, $2.00; Thomas E. Douglass, $2.00; Hugo Friedrichs, $2.50; George S. Gatchell, $2.00; Mr. Gass, 37 cents; James Simpson, $24.22; D. W. Gage, $2.00; G. A. Kraft, $2.00; F. A. R. Winter, $7.50; J. H. Weldon, $3.00; George V. Watson, $3.00; George Kellogg, $5.00; total, $62.44.

April—Colonel T. M. Sanderson, $2.00; W. E. Hingston, $2.00; Rev. James French, $2.00; B. A. Mitchell, $2.00; Mrs. Lizzie Good, $2.00; Hon. N. F. Safford, $5.00; Miss Alice Emerson, $2.00; Jacob Klein, $2.00; Rev. James A. Upjohn, $2.00; Mrs. H. Hibben, $2.00; Dr. F. Sibbald, $5.00; W. J. Spicer, $4.90; E. D. Echolls, $2.00; W. K. McAllister, $6.00; 'Hugh Ross, $2.00; E. W. S. Neff, $2.00; P. M. Arthur, $2.00; Thomas Holland, $2.44; A. G. Smith, $2.00; J. H. O'Mara, $2.00; total, $53.34.

May—Right Rev. G. T. Bedell, $2.00; Dr. G. Newcomer, $2.00; George Kelley, $2.00; Fred Bishop, $15.30; J. H. Holway, $2.00; B. C. Herrick, $2.00; J. R. Skinner, $10.00; William Bowler, $2.00; G. A. Hyde, $2.00; W. W. Evans, $2.00; Rev. J. Wild, $1.00; Rev. L. A. Lambert, $10.00; Seth Dean, $2.00; William Hart, $2.00; E. Coombs, $5.00; Capt. R. Kelso Carter, $2.00; A. P. Baldwin, $2.00; R. B. Lockwood, $2.00; R. D. McCreary, $2.00; H. G. Morse, $2.00; J. H. Emminger, $2.00; Theodore Faber, $2.00; Joseph Baxendell, $2.03; J. F. Holloway, $2.00; W. E. Bond, $2.00; G. F. Heisel, $3.05; Charles De Medici, $2.00; L. Austin, $1.00; Amory Coffin, $2.00; Anonymous, $2,00; W. Holcomb, $2.00; A. G. Bryan, $2.00; W. C. Durgin, $2.00; W. B. Chisholm, $2.00; J. Leyland Feilden, $24.35; Rev. J. F. Fahs, $2.00; P. H. Dudley, $4.00; Thomas Basnett, $3.00; C. A. G. Lewis, $2.00; E. C. Whittlesey, $4.00; Rev. Dr. Giesey, $4.00; H. W. Bigelow, $5.00; Alonzo Kasson, $2.00; Charles Scribner's Sons, $5.00; J. F. Seiberling, $5.00; Borden, Selleck & Co., $2.00; E. S. Page, $2.00; F. A. Kempt, $2.00; John A. Patterson, $2.00; C. Cone, $2.00: total, $167.73.

On the seventh inst. we received two dollars in an envelope bearing the New York post mark but no further indication of its donor. As the omission of the name was probably a mistake, we will be obliged if any one who has sent his dues without receiving an acknowledgment will inform the secretary.

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ERRATA.

Errata in STANDARD for January, 1885:

p. 629, line 18, for "moon's" *read* earth's.

p. 630, line 12, for "C sharp" *read* C.

p. 621, line 9 from below, for "H. E. Dibdier" *read* H. E. Dibdin.

INTERNATIONAL STANDARD. March, 1885. Article, "Earth's Radius," etc.

p. 49, at top: The cubits are correctly stated, but the 10 and 12 inch feet should be read *approximately* only. A mistake of the writer.

p. 49, 14th line from bottom, for "hue" *read* line.

p. 40, 8th line from bottom; and p. 41, 3d line from bottom, for "dimensions" *read* dimension.

p. 42, 3d line from bottom; p. 43, 2d line from top; p. 46, close of article; and in note at end, in the circular algorithm, $\frac{1}{24 \times 10\,n}$ or $\frac{1}{6 \times 60\,n}$, n is to be read as an *exponent* of 10 or 60, as the case may be.

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TO THE MECHANICS OF AMERICA.

We desire to reach your ears and enlist your interests in a subject which concerns every man, woman and child in the nation, and in which you have more at stake than any other class. You construct the buildings, bridges and machinery; in fact, all the works in the country, great or small.

A power has been at work for many years, silently and insidiously, to overthrow the weights and measures that you employ in the construction of everything that interests you and gives you occupation. The men who are instigating this are doing your thinking for you. They assume that your intelligence is insufficient to enable you to choose for yourselves the measures that you will use, and hence they are now petitioning Congress to set aside the system of measurement that your forefathers have used time out of mind, and to force upon you a foreign one of which you know nothing. The man who fails to use his ballot when his influence and assistance are necessary is not a good citizen, and the man who neglects to inform himself upon a subject which concerns his most vital interests, and who, through indifference, permits Congress to take away his hereditary weights and measures and to put a foreign system into his hands, is not a good citizen.

A bill was brought before the last Congress for the purpose of making the French metric system compulsory after March, 1889. Members of Congress, as a rule, are indifferent on this subject and are liable to pass the bill. If you have never investigated this matter, which so vitally concerns you, will you not now awake from your lethargy and determine that no member of Congress in the district in which you live shall have the power to change the usages of your forefathers?

If we could see that Congress had the right to make the change, and understood the true nature and derivation of that which they propose to enforce, as well as the superior value and origin of that which they may give up, then we could afford to leave it in their hands. But the majority are not instructed on this subject, and it is essential that they should be.

We claim that the Anglo-Saxon system of weights and measures is an heirloom descending to us from the remotest generations of the past; a heritage of God and divinely preserved for us, as shown in the indestructible monument in the land of Egypt—the Great Pyramid of Jeezeh.

We beg you to study this subject, and to this end we ask you to subscribe for this Magazine, which investigates the origin and value of our hereditary system of weights and measures.

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